APRIL 7, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

Ford

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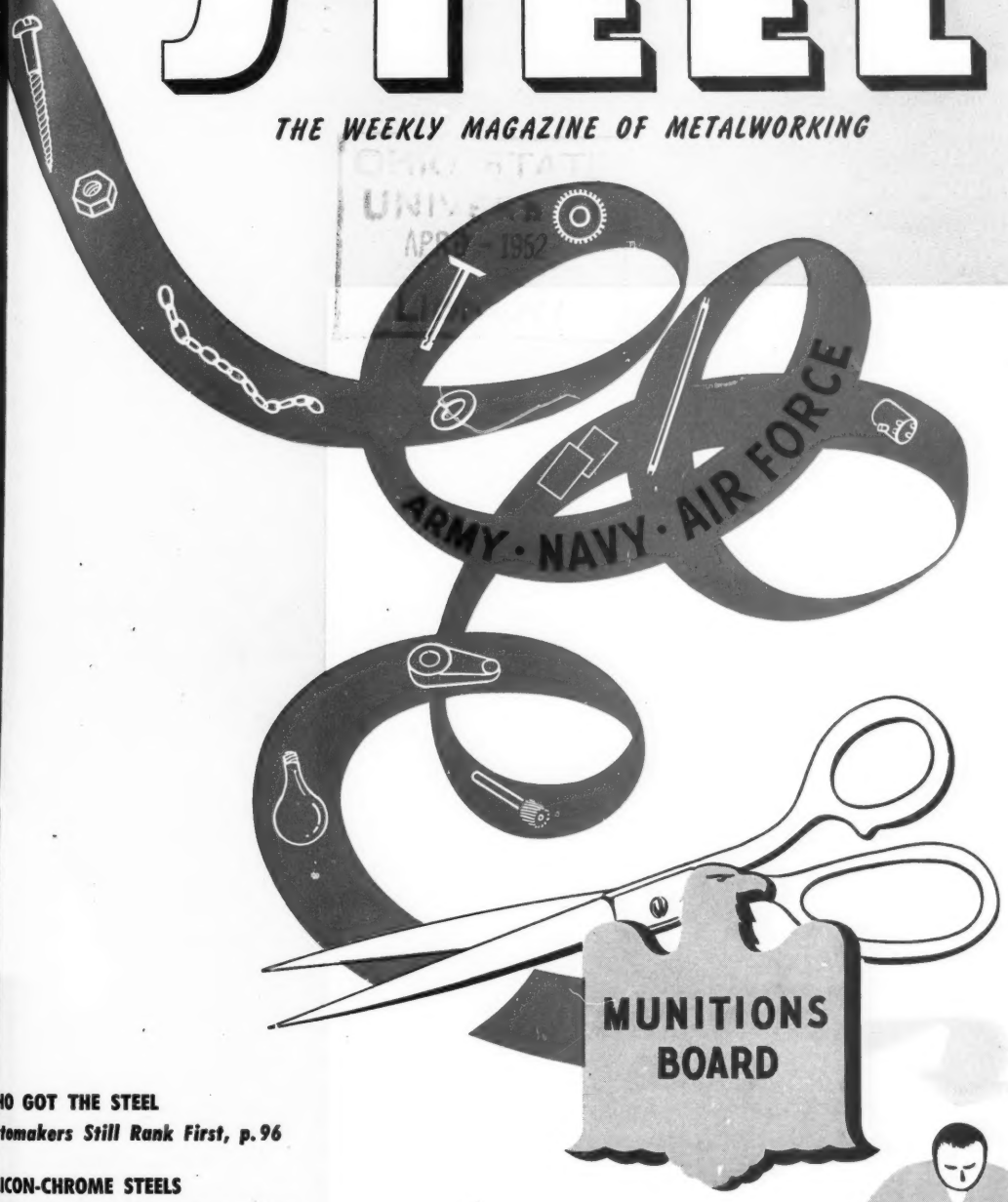

WHO GOT THE STEEL
Automakers Still Rank First, p. 96

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Better Hardenability Control, p. 114

PLUG-IN INDUCTION HEATING
No Generator Required, p. 118

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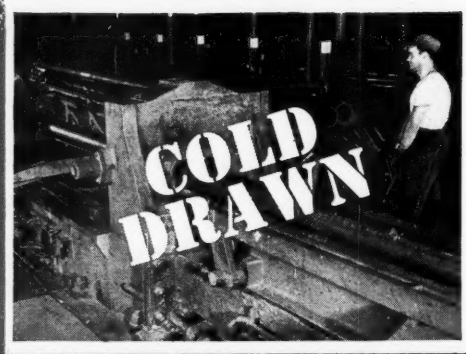
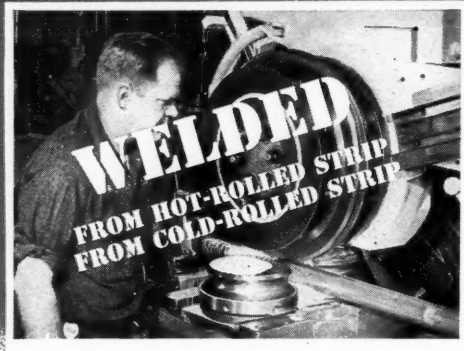
A 12401

Let's take a

CLOSER LOOK

at TYPES of Tubing





Different in surface finish. Different in dimensional tolerances. Different in machinability. Different in cost. Once you have determined to simplify fabrication of hollow parts with versatile seamless or welded tubing, be sure you're using the *right type* for the job at hand. If you're a long-time tubing user, review all types available to *know* that you're getting the most for your money. Each type has its place—ONE type is best for *your* specific requirement.

The B&W Technical Staff is always ready to cooperate with you in the selection of the proper carbon, alloy, or stainless tubing for your job. Their aim is to help you avoid difficult fabricating problems, eliminate rejects, and save production time and costs.

If you have a specific tubing requirement, tell us end-use, OD, ID, size of finished part, method of chucking and sequence of machining operations, description of finished part, finishing procedure—welding, brazing, plating, heat-treating, carburizing, nitriding, special dimensional accuracy if required, and type of finish desired. Put your problem up to Mr. Tubes—your B&W Tube Representative.

New Bulletin TB-340 is a compact guide to mechanical tubing possibilities, and well worth writing for.

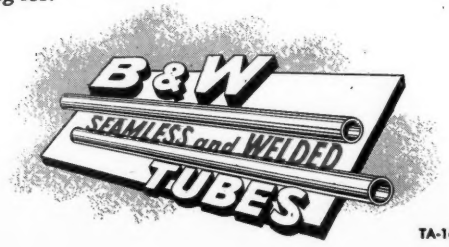
THE BABCOCK & WILCOX COMPANY

TUBULAR PRODUCTS DIVISION

General Offices & Plants

Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill. Cleveland 14, Ohio • Denver 1, Colo. • Detroit 26, Mich. • Houston 2, Texas Los Angeles 17, Cal. • New York 16, N. Y. • Philadelphia 2, Pa. St. Louis 1, Mo. • San Francisco 3, Cal. • Syracuse 2, N. Y. Toronto, Ontario • Tulsa 3, Okla.



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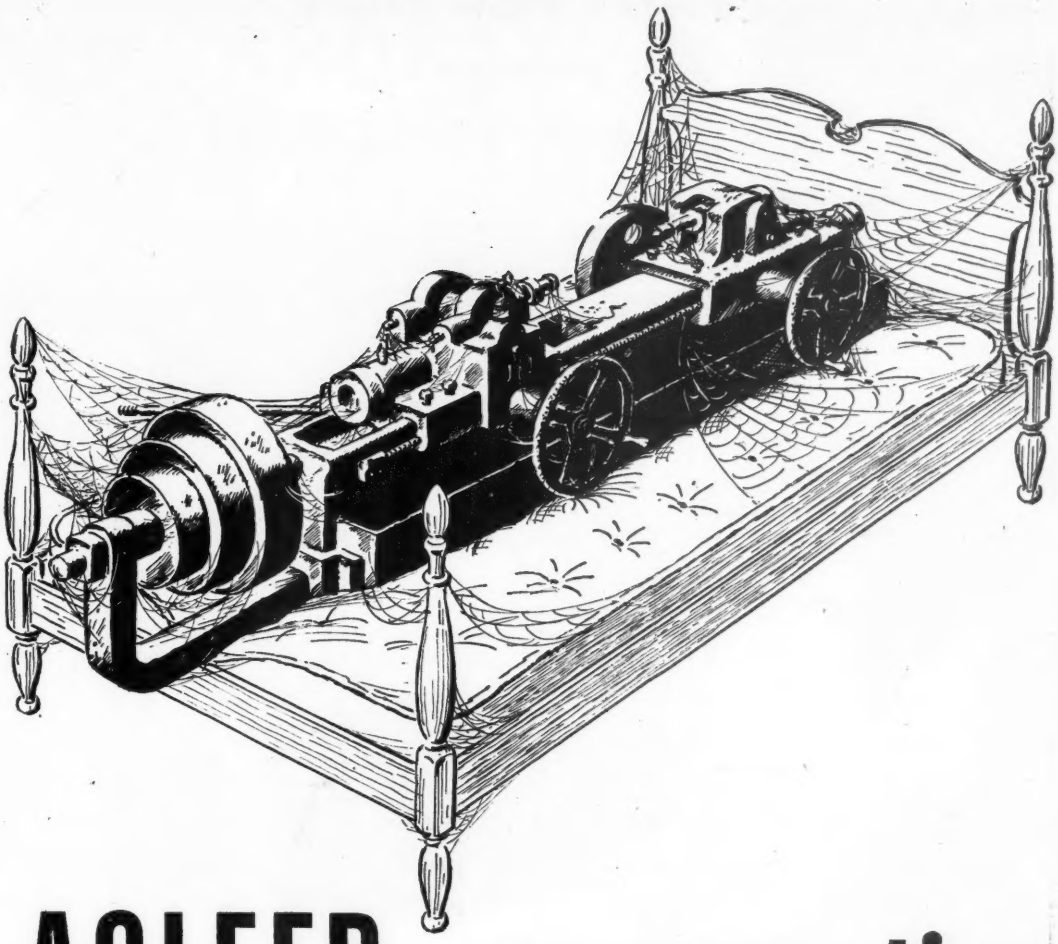
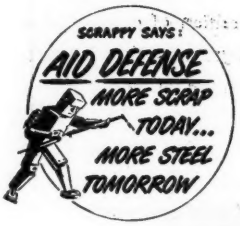


ASLEEP...on your time



An obsolete or worn-out machine, stuck away, sleeping and forgotten in a corner of your plant, is costly.

It is not doing you or anyone else any good. It is taking up valuable space.

Call in a scrap dealer and let him haul away your dormant scrap. It will help to supply the tons of additional scrap that is needed if the country's steel furnaces are going to continue working at full capacity.

Today there are millions of tons of dormant scrap hidden away in plants and factories, and on farms.

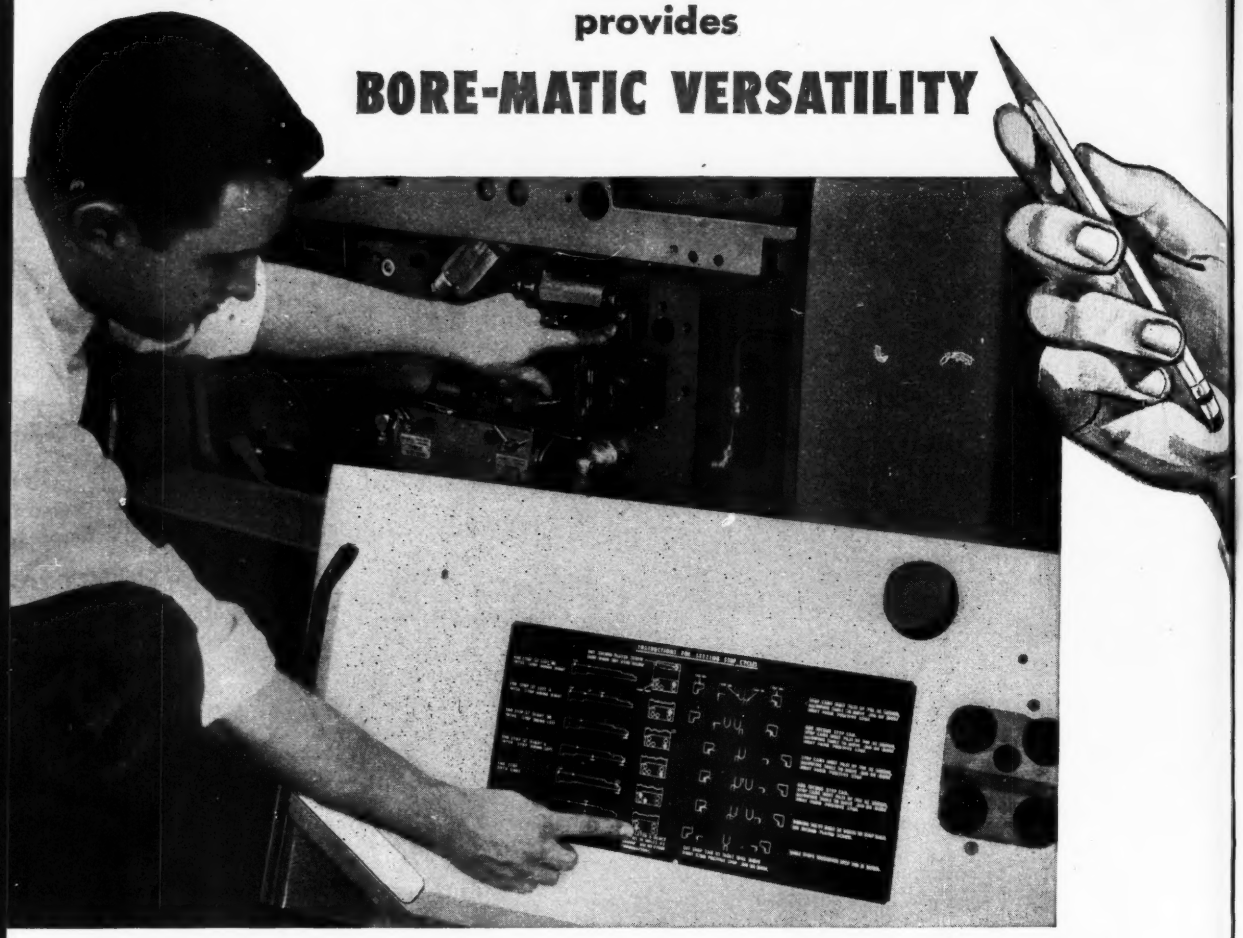
If the steel mills can get that scrap, the steel supply picture will be very much brighter, with more steel for everybody. Call in a scrap dealer today!

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

More Scrap Today... More Steel Tomorrow

Here's How Heald provides BORE-MATIC VERSATILITY



The Automatic Cycles on your Heald Bore-Matic can easily be changed without additional equipment

Webster defines the word *versatile* as follows: "Turning with ease from one thing to another; having aptitude for new tasks." That's exactly what is meant by the versatility of a Heald Bore-Matic. Although normally supplied for a specific job, each machine is designed to permit the use of several basic machine cycles. Conversion from one cycle to another is simply a matter of turning a knob, changing the position of a screw, and readjusting the table cams and dogs. Instructions for making these changes are included on the inside of the control panel cover as shown above.

If you have a changeover problem, just call your Heald representative. His most important job right now is helping you *get the most* out of your Heald equipment.

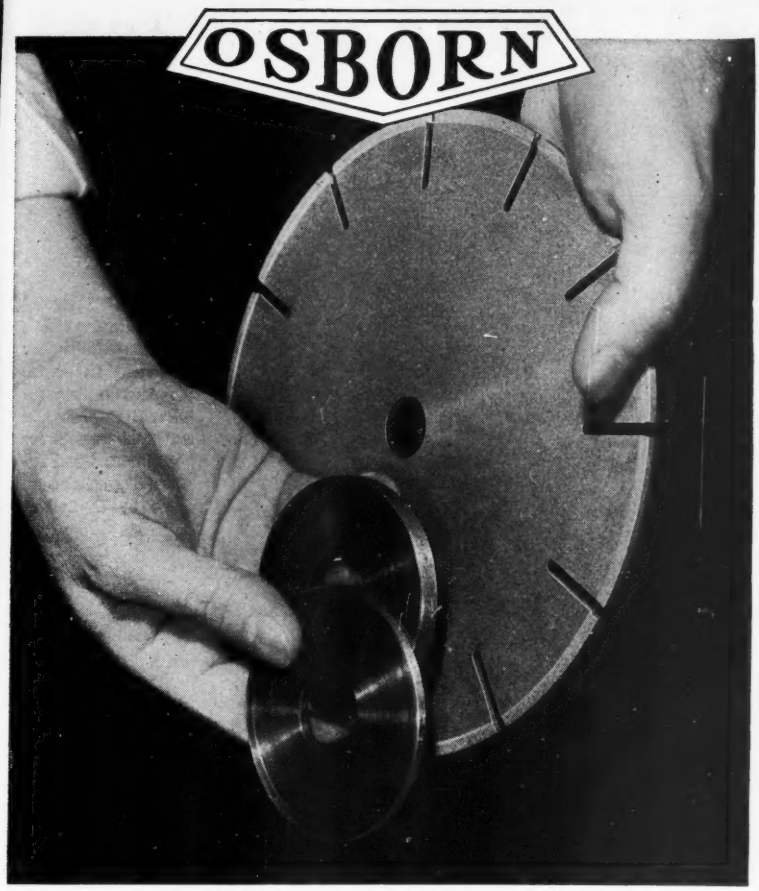
HEALD

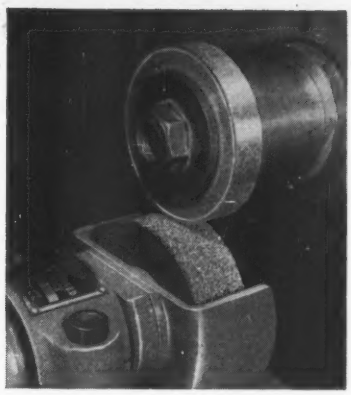
Heald machines speed the nation's production

THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

Branch Offices: Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York





TRUE THE SURFACE. With this set-up true two diamond wheels at a time. Surfaces become uniform and perfectly flat. Usually takes about 15 to 30 minutes.

BRUSH THE MATRIX. Rotate the two wheels counter to rotation of Osborn wire wheel brush. This dressing removes some of the brass matrix. Leaves the diamonds exposed.

SEE THE DIFFERENCE. Two wheels on left show grooves before truing. Surface is arched. Two wheels on right have been trued and dressed. Dressing increased cutting action 80%.

Diamond-saving idea makes them do 80% more work!

Longer life and faster production from critically scarce industrial diamonds are being obtained by this method of dressing diamond wheels:

When wheels become grooved and out of square, true them by grinding, two at a time. After truing, mount wheels together in grinder and dress with counter-rotating 8-inch Osborn wire brush. This brushing removes some brass matrix, exposing the diamonds. One plant reports that this increases the wheel's cutting action 80%.

This is typical of many production aids available through your **O**sborn **B**rushing **A**nalyst. Call him today or write *The Osborn Manufacturing Company, Dept. 671, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

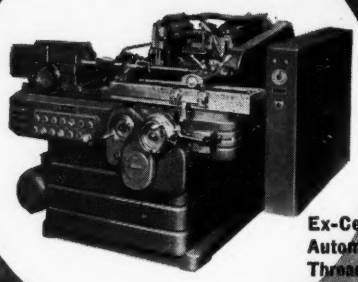
Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

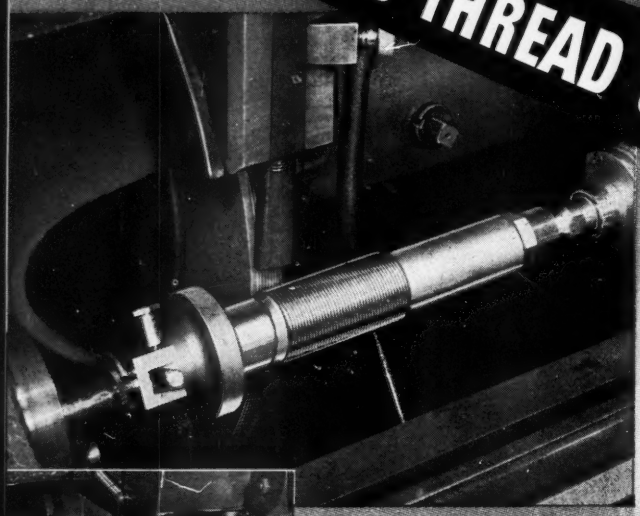
THE BUSIEST MACHINE IN YOUR SHOP

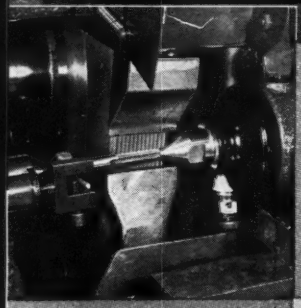
EX-CELL-O

AUTOMATIC THREAD GRINDER



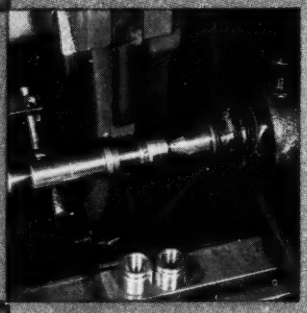
Ex-Cell-O Style 33 Automatic Precision Thread Grinder for external threads. Standard models for internal threads and universal models for both internal and external threads also are made by Ex-Cell-O.



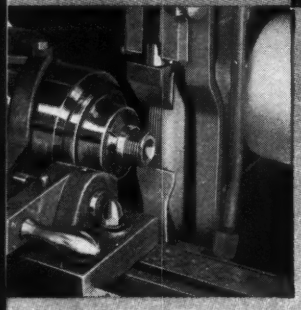


Grinding threads on cast-iron part with diamond dressed multiple-rib wheel on a Style No. 33 Grinder.

Skip-tooth diamond dressed multiple-rib wheel (wheel form is twice pitch of thread) grinding a ⅜"—18 tap.



Threading stainless steel aircraft bushings on an Ex-Cell-O Style 33 Automatic Thread Grinder.



Grinding threads on the end of a machine gun barrel which is held within a special work head.

For high production with extraordinary precision, Ex-Cell-O Style 33 Automatic Thread Grinder is a popular choice. It is easy to set up and operate. With equipment for using multi-rib wheels, as shown in the accompanying photographs, output exceeds other methods.

Thread grinding is a must for hardened steel parts. More and more shop supervisors are discovering that grinding is also economical for materials that are tough and abrasive, or soft materials that are inclined to tear under the pressure of cutting tools.

For more information on thread grinding call your Ex-Cell-O representative or write directly to Ex-Cell-O. Please state whether you are interested in internal or external threads or both.

XLO

EX-CELL-O CORPORATION DETROIT 32 MICHIGAN

51-28

MANUFACTURERS OF PRECISION MACHINE TOOLS
CUTTING TOOLS • RAILROAD PINS AND BUSHINGS
DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

This Week in Metalworking

STEEL

Vol. 130 No. 14 April 7, 1952

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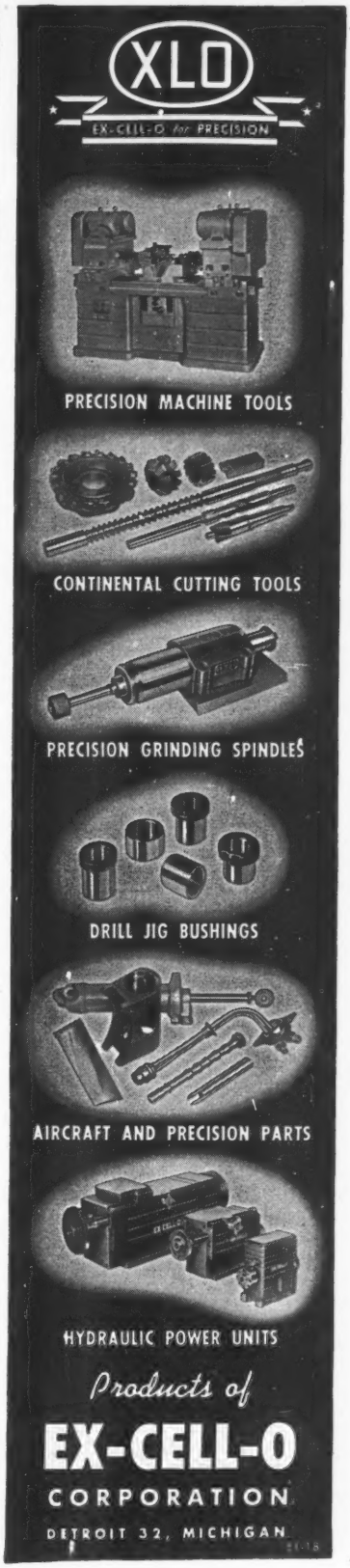
Editorial, Business Staffs—10. Advertising Index—234. Editorial Index available semi-annually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1952 by Penton Publishing Co.



CLEAR UP YOUR Grinding Jobs with the Right PELRON GRINDING COMPOUND

PELRON GRINDING COMPOUNDS, water soluble, produce a clear solution that not only prevents loading the finest grit wheel, but facilitates the work by enabling the operator to see the piece at all times.

PELRON GRINDING COMPOUNDS provide all the other desirable features of a grinding compound: excellent detergent properties, rapid settling of chips and grind particles, high rust preventive quality, stable in emulsion, neutral to the skin.

PELRON TECHNICAL SERVICES include, free, expert advice on facilitating many metal-working operations, through the use of PELRON special chemicals for industry: cutting oils, grinding, drawing and forging compounds, metal cleaners, rust preventives, etc., etc., etc.

Write us regarding your special problems. We're always "looking for trouble"—with the object of licking it, reducing *your* worries, increasing *our* experience.

Get in touch with our nearest office.

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LYONS, ILLINOIS

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Behind the Scenes...

On the Job

We went upstairs a while back to spend an hour seeing just what editors do. We dropped in on Engineering Editor Walt Toerge to sample his activities and decided that the telephone is the invention of the devil. In the hour we spent with Walt his phone rang seven times.

We just sat back and watched as he proceeded to go about his affairs. One phone call was from Associate Editor Ed Karpick in Pittsburgh on an assignment. They discussed something about electro-machining that Ed had uncovered. The second call was from someone inquiring about when a forging story would appear. Then Assistant Editor Bob Hall appeared in person regarding a Detroit meeting of the American Institute of Electrical Engineers which he will cover.

After those details were ironed out, Walt began editing a story written by Howard Tuttle, STEEL's Detroit man. In the middle of that came the third phone interruption. Somebody was returning his earlier call. It had to do with a technical symposium on inspection and gaging and Walt made arrangements to attend. Associate Editor Vance Bell phoned next to check on the technical details of sulphurized bar stock steel. He was working up a market yarn on the subject. The fifth and sixth phone calls concerned scheduling details for issues two and three weeks in advance.

With his eye on the calendar, Walt would say, "Shift the machining piece to Apr. 14, can you? We'll fill the hole Apr. 21 with the thing on stainless steel."

On two walls in his office are large calendars, so he can see the date from two directions. As he returned to the Tuttle piece he was editing, we twice saw him glance at the calendar directly above his desk, mentally to calculate when the story should run.

We got up to leave as his phone rang for the seventh time. It was his wife, reminding him to pick up his shirts at the laundry on the way home.

These Texans

In a publication called *Speed Gab,* put out by Reeves Pulley Co., Columbus, Ind., appears a startling story which is claimed to be the gospel truth.

An oil man in Texas, needing funds to drill a well, advertised for 1000 investors with $100 each. He guaranteed unconditionally that each would get his original investment back in ten years and if the well came in they would, of course, share in the profits. Within a few days the oil man had received the $100,000 through the mails.

Postal authorities watched the transactions with dubious eyes and began to investigate.

They found no basis for complaint. Upon receipt of the money the oil man sent each of the investors a $100 Defense bond which would mature in ten years. Having spent $75,000 for the bonds, he had $25,000 in cash with which to operate, and the well was drilled.

In a Rush

At one of the numerous ore-boat launchings that American Ship Building Co. has had lately at Lorain, O., a brawny shipbuilder high in the stern of a vessel poised for the big splash was heard to say to a stocky fellow on duty at the guillotine far below:

"Hurry up, Toughie, we gotta start another one."

Puzzle Corner

In the Mar. 24 problem, the pole top must fall 88.24 feet from the back of the station and break 1.13 feet from the base. First in with that answer was Lawrence Brittingham.

Here's a puzzle submitted by R. Vecciarelli of Mohawk Steel Co. Inc. A farmer has $100 and he wants to buy 100 animals. A pig costs $10 each, a chicken $3, a rabbit 50 cents. The farmer wants exactly 100 animals and he wants to spend exactly $100. He also wants at least one of each kind. How many of each kind of animal does he receive for his $100?

Shrdlu

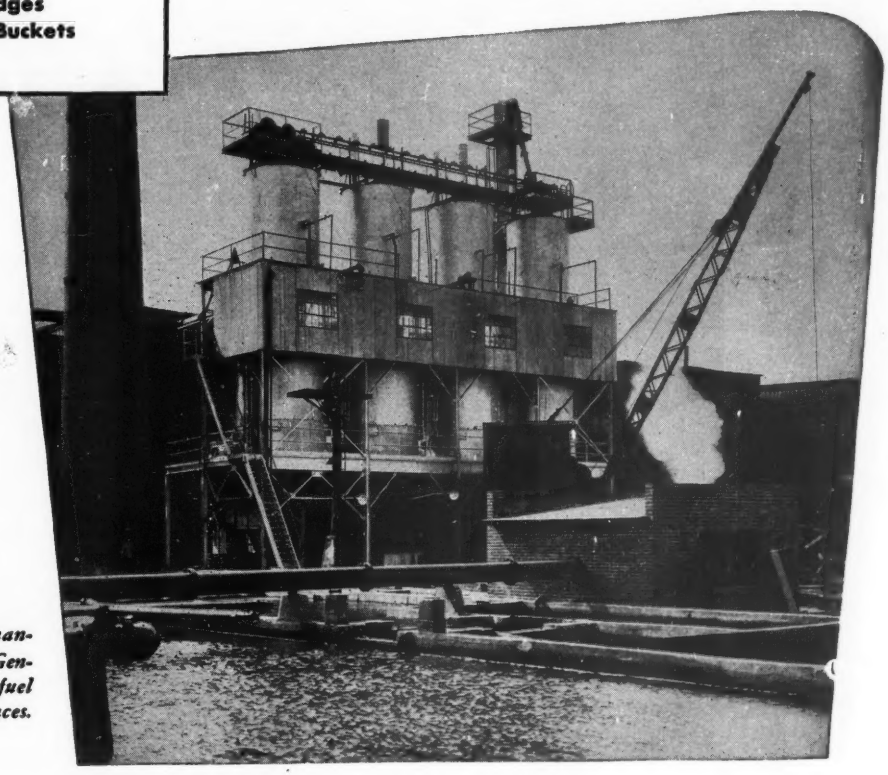
(Metalworking Outlook—Page 77)

Wellman will build it

- Special Cranes
- Gas Producer Plants
- Charging Machines
- Industrial Furnaces
- Car Dumpers
- Gas Flue Systems
- Gas Reversing Valves
- Coke Pushers
- Mine Hoists
- Skip Hoists
- Ore Bridges
- Clamshell Buckets

Wellman-Galusha Clean Gas Generators

Built exclusively by Wellman



Four 10 ft. Wellman-Galusha Clean Gas Generators supplying fuel for steel mill furnaces.

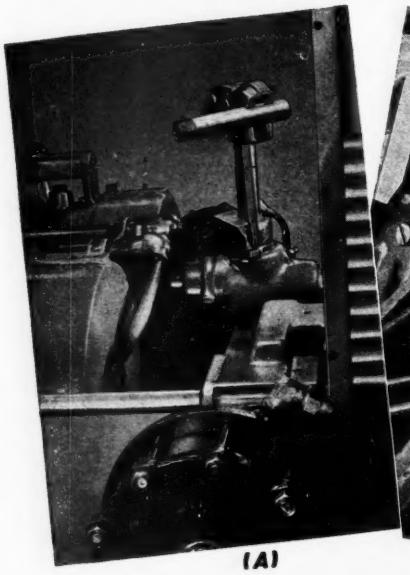
• Only Wellman builds the Galusha Clean Gas Generators that so ideally meet your requirements with efficiency and economy. These generators combine, in a *complete* machine, the rotary grates, ample fuel storage bin, and provisions for generating the steam required for making the gas. Even the lowest-priced grades of Anthracite and coke can be satisfactorily gasified.

THE WELLMAN ENGINEERING COMPANY

7029 CENTRAL AVENUE • CLEVELAND 4, OHIO

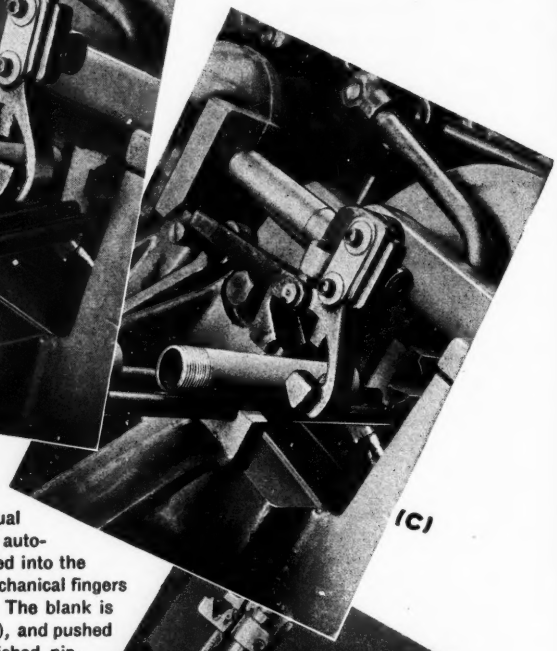
FEWER WORK STOPPAGES

WITH THE IMPROVED LANDIS AUTOMATIC NIPPLE MACHINE



(A)

(B)



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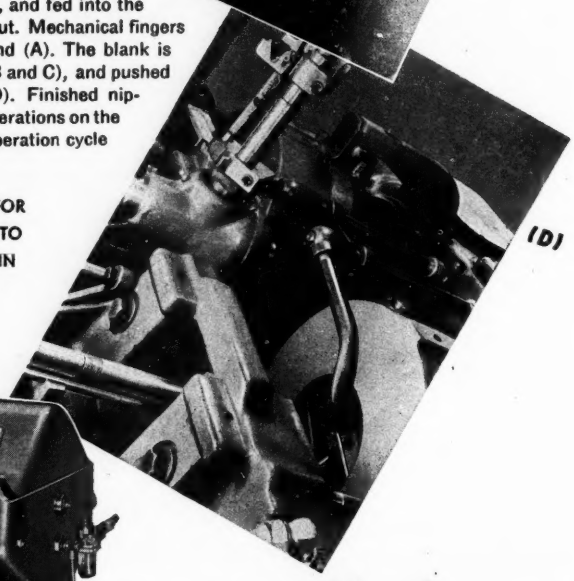

(D)

● New Transfer Mechanism allows longer running time

● The operation cycle, in which both ends of nipples are threaded, reamed, and chamfered, is completely automatic. During operation, the operator must only give the machine visual attention and keep the magazine filled. Blanks are released automatically from the magazine into the left-hand carriage, and fed into the die head at a rate equal to the lead of the thread being cut. Mechanical fingers pick up the semi-finished nipple and turn it end-for-end (A). The blank is placed on the work-rest bar of the right-hand carriage (B and C), and pushed into position for the operations on the unfinished end (D). Finished nipples are ejected automatically. Simultaneous with the operations on the right-hand carriage, a second blank is beginning the operation cycle on the left-hand carriage.

WRITE FOR INSERT TO BULLETIN D-84

LANDIS *Machine* CO.

WAYNESBORO • PENNSYLVANIA

THREADING MACHINERY—THREAD CUTTING DIE HEADS—COLLAPSIBLE TAPS

This man is on our payroll . . . but he works for you!

Not just a Social Security number or a name in a file — not just the Bolt & Nut salesman who comes around occasionally.

A Sterling Bolt representative is a genuine, real and helpful human being. And like all of us, he is doing the best job he can.

Every company likes to think of their men as the best available. Sterling Bolt Company feels that way too.

Of course, we try to sell bolts, nuts, screws and washers to as many companies as will buy them, but the bigger job— that of keeping customers satisfied and keeping satisfied customers—is the goal towards which we have worked, day-by-day for more than thirty years. And we take our hats off to our salesmen who, though on OUR payroll, work for you.

STERLING BOLT CO.

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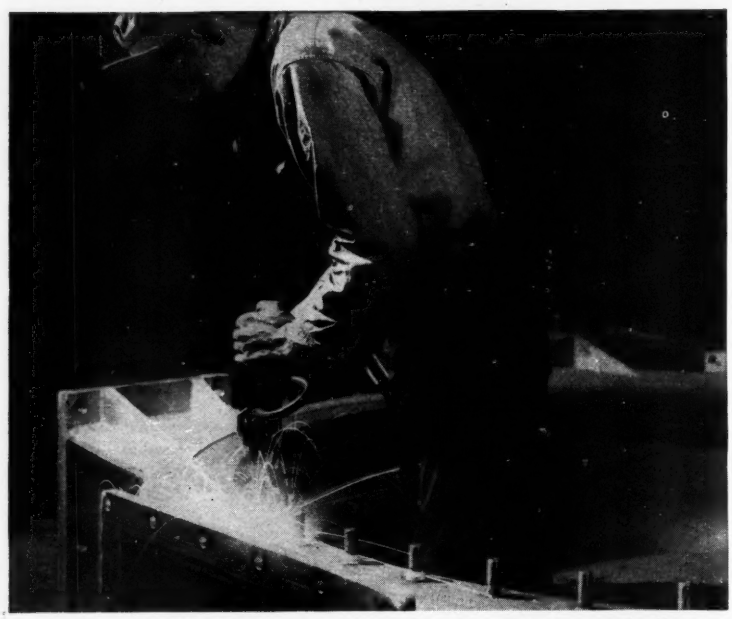
NELWELD CASE HISTORY IN HEAVY EQUIPMENT



Nelweld operator welding 7/8" dia. studs at a rate of 4 or 5 per minute on a mounting flange of a coal pulverizer casing. Photo courtesy of Combustion Engineering-Superheater, Inc.

HOW TO SAVE 7 HOURS, 7 MINUTES IN AN EIGHT-HOUR DAY!

THE PROBLEM — How to cut down production time necessary for the installation of ninety-six 7/8" dia. studs on the mounting flanges of a large, heavy casing—requiring considerable labor and equipment time for handling, drilling, and tapping.

THE NELWELD ANSWER—One workman, using the light-weight Nelweld gun and Nelson granular flux-filled studs, end welds each stud in less than 20 seconds—*at least ten times faster than former methods!* He simply inserts the stud in the chuck, locates it on the work, and presses the trigger—Nelweld does the rest and the stud is set! *By time study comparison, the Nelweld Method did the same job formerly requiring eight hours in less than 54 minutes!*

THE RESULT—One man, working in one spot with a portable Nelweld unit, has released the equipment and manpower formerly required for the handling of ninety-six separate drilling, tapping and setting operations.

Change-over to the Nelweld method required only a minor investment, with immediate results in decreased production and fabricating costs. These same outstanding Nelweld advantages can prove valuable in your fabrication of equipment.

For complete information on the advantages of Nelweld as applied to your fastening techniques, contact the nearest Nelson office or write Department S-1, Lorain, Ohio.

Fasten it Better...at Less Cost, with NELWELD T. M. REG.

NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

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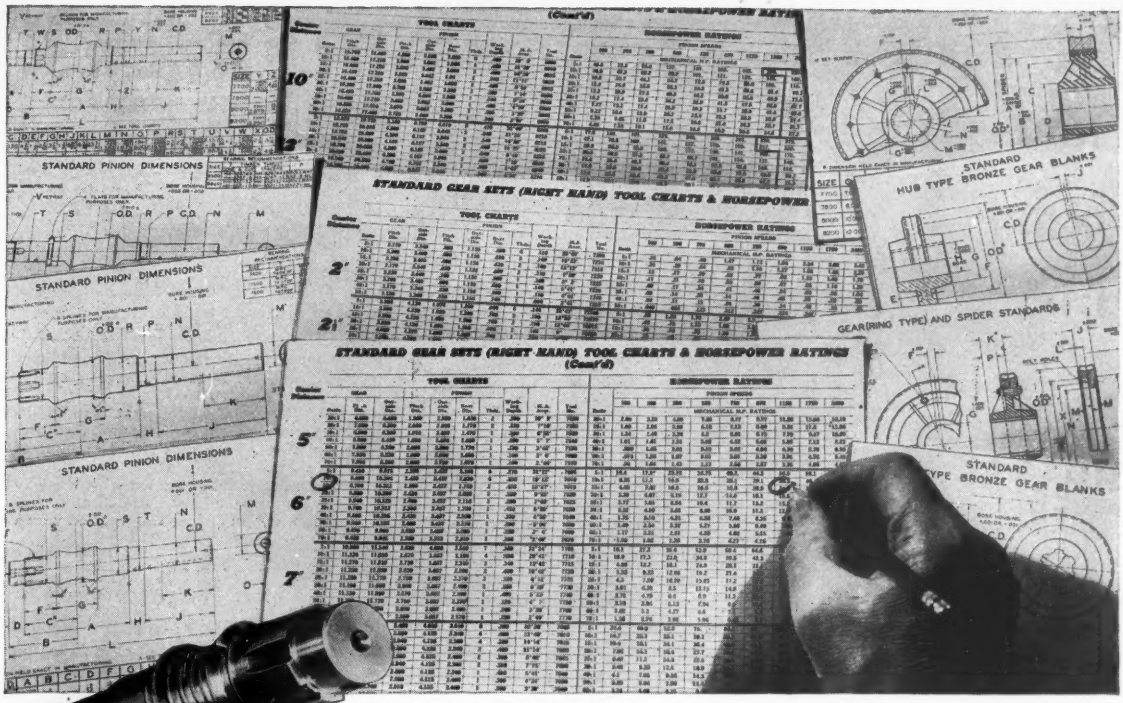
STANDARD PINION DIMENSIONS
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STANDARD GEAR SETS (RIGHT HAND) TOOL CHARTS & HORSEPOWER
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STANDARD HUB TYPE BRONZE GEAR BLANKS
GEAR (RING TYPE) AND SPIDER STANDARDS
STANDARD HUB TYPE BRONZE GEAR BLANKS

plus this vital feature

Standard *Cone-Drive gears and worms are carried in stock. Cone-Drive gears are noted for their long life—BUT if a failure should occur at any time, replacement gears and worms are available without delay.*

Ask for Catalog No. 700

Specify STANDARD Cone-Drive Gears and get all these advantages

Lower Cost—due to smaller size of gears and housings, mass production of worm and gear blanks, etc.

Compactness—due to distribution of load over greater contact area, reducing unit pressures. As a result, gear sets can have smaller center distances, enclosures can be smaller, etc.

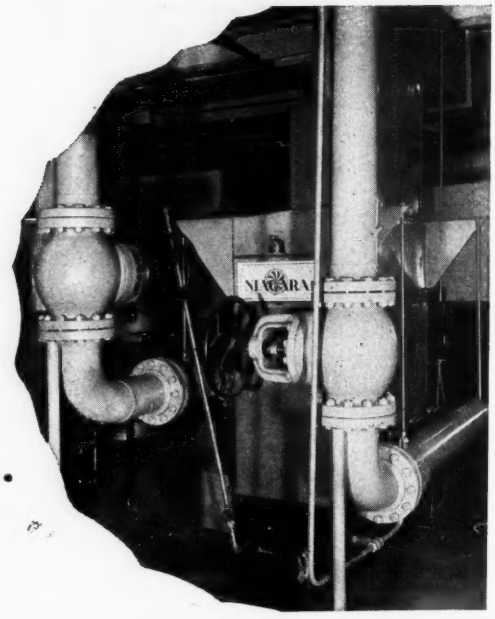
Less Weight—due to smaller center distances for a given horsepower or torque. Other types of gearing weigh up to 3 times as much for the same horsepower transmitted.

Greater Smoothness—because Cone-Drive gears have more teeth in continuous contact than other forms of gearing.

Wide Range of Sizes—Center distances from 2" to 18" provide horsepower ratings from fractional up to 800 horsepower. Ratios range from 5/1 to 70/1.

CONE-DRIVE GEARS
Division, Michigan Tool Company
DOUBLE ENVELOPING GEAR SETS & SPEED REDUCERS
7171 E. McNichols Road • Detroit 12, Michigan

How to get drier or cooler gases . . .



NIAGARA AERO AFTER COOLER cools a compressed gas, or air, below the temperature of the surrounding atmosphere, thus preventing the condensation of moisture in your lines. The gas will contain only half of the moisture left in it by conventional methods. Even drier gas can be produced if you require it.

In working with controlled atmospheres of inert gases to prevent undesired reactions, this dryness of the gas at low cost is a great advantage. The cost of the Niagara method is low because it uses evaporative cooling, saving 95% of the cost of cooling water (and its piping and pumping). This direct saving of cost pays for the Niagara cooler in less than two years.

If you use compressed air to operate tools or pneumatic equipment you save much in water and oil damage to tools and equipment, and in water damage to materials by using the Niagara Aero After Cooler.

Write for a bulletin, or ask nearest Niagara Field Engineer if you have a problem involving the industrial use of air.

NIAGARA BLOWER COMPANY

Over 35 Years' Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave. New York 17, N. Y.

Experienced Field Engineers in Principal Cities of U. S. and Canada

LETTERS
TO THE EDITORS

Sales Stimulator

Thank you for your recent publicity concerning our automatic banding equipment, (Feb. 4, p. 166).

We have received a great deal of interest through the article and feel that it will result in a substantial amount of sales of this equipment.

We are also very pleased with the way your organization has handled the "follow-up" in forwarding information which they received.

C. R. Gibbons
sales manager
Guide Co.
Leetonia, O.

Scholastic First Aid

I am preparing a technical paper on wire-rolling. E. V. Creagh, American Chain & Cable Co. Inc., suggested that I contact STEEL for helping in locating material on this subject.

John R. Loren
Polytechnic Institute of Brooklyn
Jersey City, N. J.

• *We suggest you contact American Wire Division, U. S. Steel Co., Rockefeller Bldg., Cleveland, for their "Manual of Wire for Manufacturing Purposes."*

STEEL's Everywhere

I find STEEL in nearly all the offices where I call. I like it very much. Here is my subscription.

T. B. Janes
Pure Oil Co.
Columbus, O.

Who and Where Department

Your article "Differential Coating Process" (Dec. 17, p. 104) mentions the use of a Stroboscopic light. Who manufactures this device and is it available in a mobile unit?

L. C. Teague, purchasing agent
Tennessee Coal & Iron Division
United States Steel Co.
Fairfield, Ala.

• *Contact the General Radio Corp., Cambridge, Mass. The Stroboscopic Light mentioned in STEEL is known as Strobotac, type 631-B.*

Who developed the materials described in your article "New Ferrites Found" (Jan. 28, p. 63) and where may we obtain more information on them?

R. E. Kellers
New Jersey Zinc Co.
New York

• *For further information write to General Electric Co., Schenectady 5, N. Y.*

FLAT SPRING STEEL

You can get it now! . . . and we believe it's the best spring steel we've ever made

OUR NEW specialty spring steel plant is in full swing. Equipped with today's most modern, precision machines, we believe we're producing flat spring steel that gives more for your money than ever before.

This new spring steel is tops in uniformity. It saves you preparation time . . . cuts down machine stoppages . . . gives you the greatest number of perfect parts from every foot and pound of steel.

With our greatly increased capacity we can make prompt deliveries on flat spring steel. And if you need high carbon round or shaped wire, ask what we can do. John A. Roebling's Sons Company, Trenton 2, N. J.

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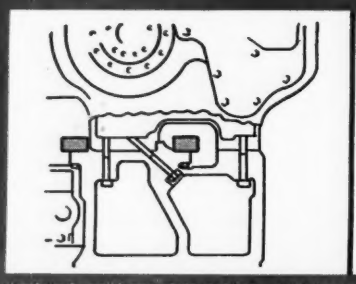
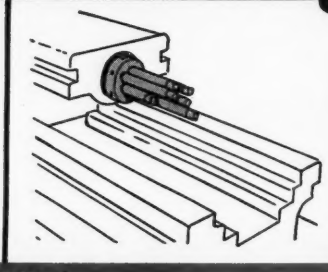
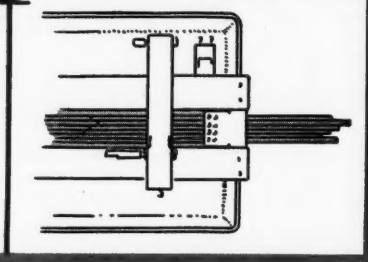
another reason why J&L turret lathes produce { *MORE CHIPS PER TOOL*
MORE PIECES PER HOUR
MORE PROFIT PER JOB

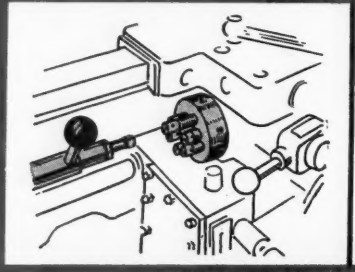


Headstock, solid one-piece casting—extra heavy sections. Wide stable bed. Hardened and ground steel ways.

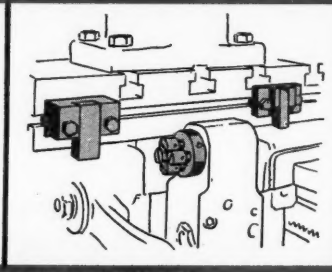


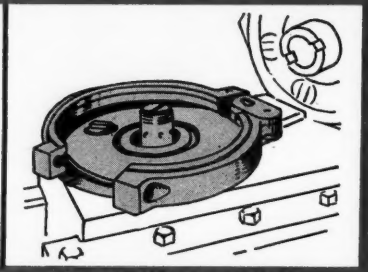


Positive, accurate stops for hexagon turret.



Positive, accurate stops for carriage and cross slide.





Accurate, positive turret indexing.

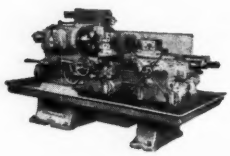
MORE ACCURACY!

The headstock is cast separately in one piece, with extra heavy sections to dissipate heat and minimize distortions. Bed is a heavy sectioned casting, with shoulders the full length for accurate alignment of the ways with the headstock.

The replaceable hardened solid steel ways are precision ground—parallelism is held to .0003 in both width and thickness, their entire length. All cuts (within rated capacity) taken on or between bedways.

All feeds are disengaged against easily set *positive* stops, through *positive* metal-to-metal contact.

Turret rotates on hardened, ground and lapped center pin—bearing surfaces are hand scraped. Locking pin and bushing provide solid, flat abutments with maximum contact area.



P.S. *These machines will pay for themselves quickly through savings in direct costs alone. Write to Dept. 710 for Catalog.*

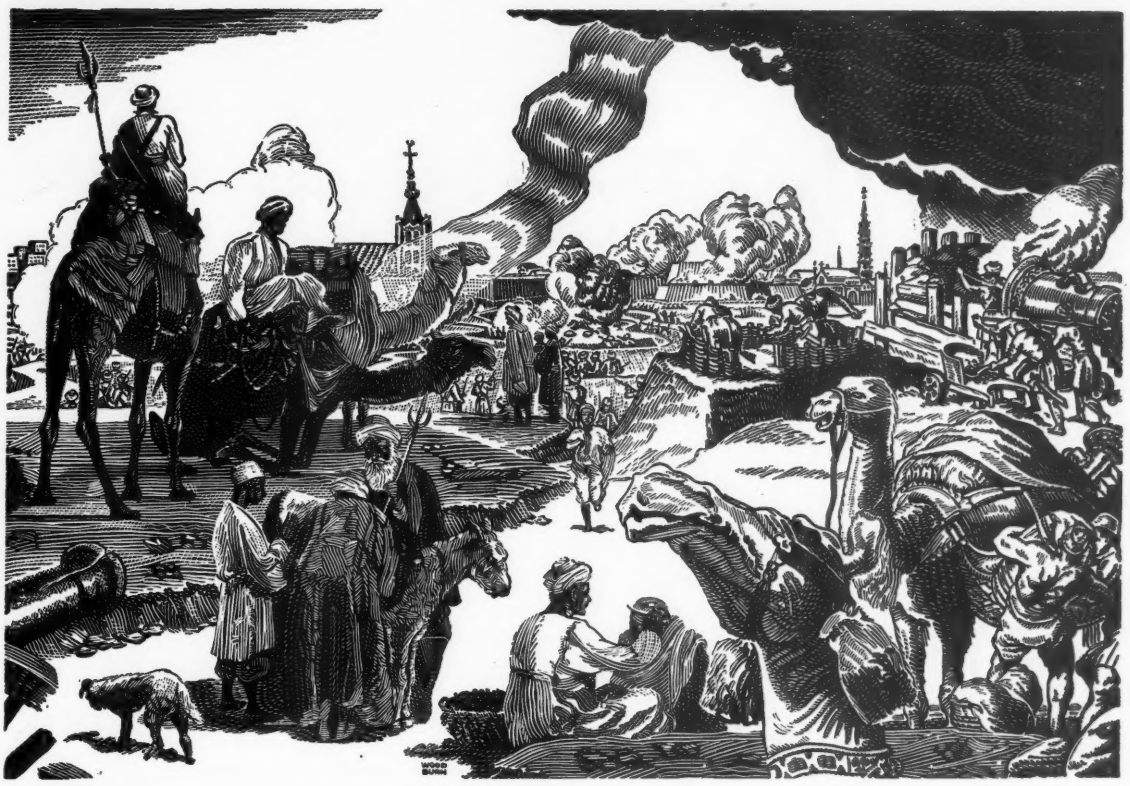
"World's most accurate and powerful turret lathes"

RAM TYPES: Bar, 1½" to 4½", Chuck, 10" to 12". SADDLE TYPES: Bar, 2½" to 5", Chuck, 12" to 18".

JONES & LAMSON

Machine Tool Craftsmen Since 1835

JONES & LAMSON MACHINE CO., Springfield, Vt., U.S.A. TURRET LATHE DIV.



Steel saved civilization at Vienna

MODERN history begins with the record of conflict between Christians and Moslems--six centuries of wars that opened with the Crusades and saw the Turks capture Constantinople in 1453.

More than 100,000 Turkish janizaries and cavalry besieged Vienna in 1683. For two months, to quote the diary of an eye witness, "The enemy continued playing their cannon and granadoes. But the city walls were strong, Christian cannon were bigger and more numerous and ammunition more plentiful." Finally came a day when the officer's journal reported, "The enemy did not play their cannon so fast. It was confirmed that they had no great provision of bullets, inasmuch as they shot back not only our bullets, but also pummels of swords and all sorts of iron and stones."

At last a great Christian relief army was assembled. "They made an attack in the best order that ever army did. The enemy, forced always to give back, were put all into confusion. They betook themselves to flight, leaving all their provisions, ammunition, cannons and tents --the greatest part rendered unfit for farther use by our great guns."

Never again did the Turks seriously menace Christendom. Western civilization had been saved once more by its supremacy in the use of iron and steel. To aid our survival America's free private industry is producing steel at the highest rate ever known--and still expanding. The question remains--Will America use enough of this tremendous steel production to guarantee the continued supremacy of Western, Christian civilization?---We believe the answer is yes!

YOUR SCRAP IS NEEDED — YOUNGSTOWN

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio

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MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment.

we Hug That Work

to cut your portable grinding costs!

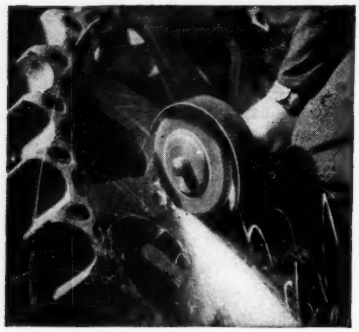
FASTER GRINDING, LONGER WHEEL LIFE AND LESS OPERATOR FATIGUE add up to big savings when Norton wheels take over your portable grinding jobs. *They hug that work!*

Yes, Norton portable grinding wheels have *controlled uniformity* and *built-in balance*, the like of which you've never seen before. This gives them a unique ability to stay in more continuous contact with the work. This *plus* comes from the "new process" of manufacture recently developed by Norton technicians . . . an outstanding step in the continuing Norton program to cut all your grinding costs.

Ask your nearby Norton distributor to give you all the facts about new, improved Norton portable grinding wheels. He's listed under "Grinding Wheels" in your classified telephone directory. Or write direct to Norton Company, Worcester 6, Mass. Distributors in all principal cities.

EXPORT: Norton Behr-Manning Overseas Inc., Worcester, Mass., New Rochelle, N. Y.

NORTON PORTABLE GRINDING WHEELS HUG THAT



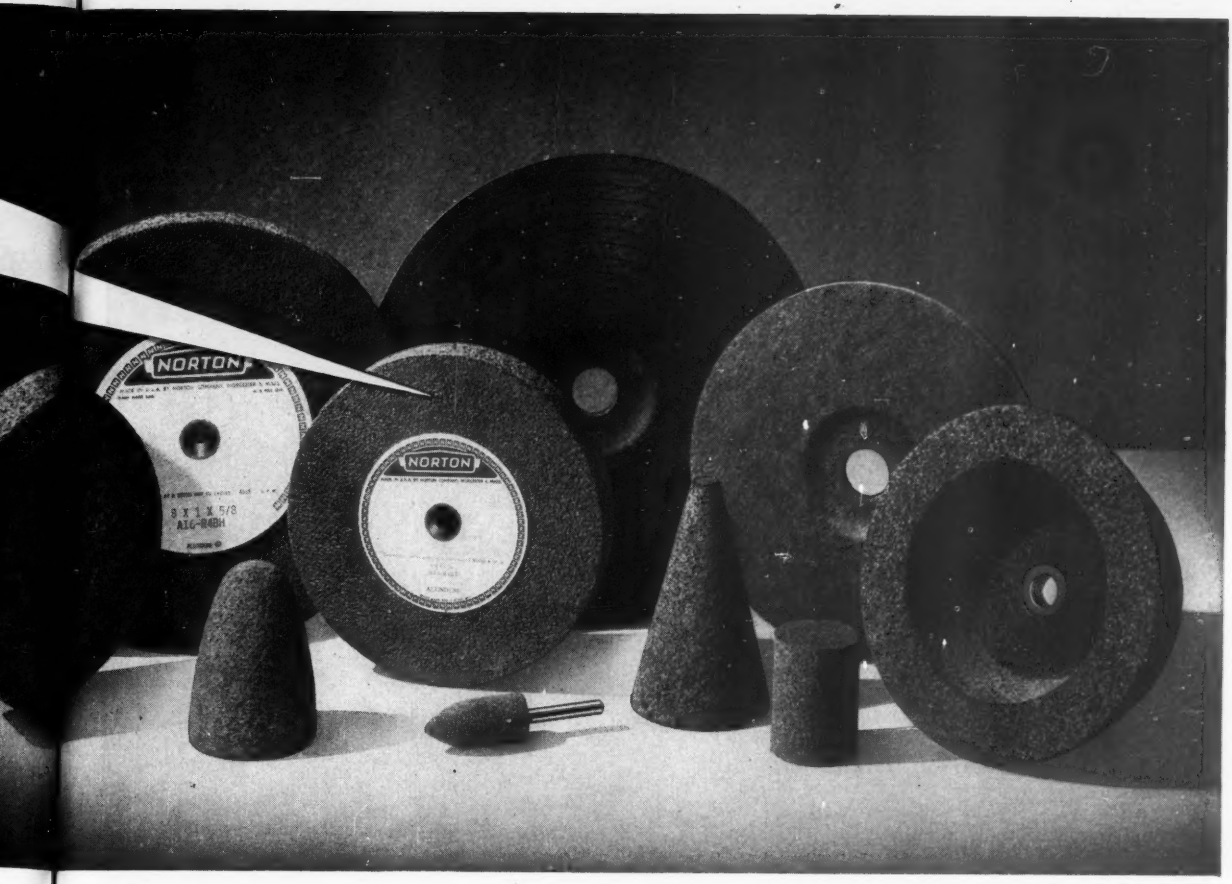
SNAGGING GIANT DRIVE WHEELS is just one of many jobs done by Norton straight wheels at lower labor and wheel costs. *They hug that work.* So, they don't waste time or wheels . . . nor tire the operator.

HEAVY DUTY WELD GRINDING is another job for which Norton straight wheels are the popular choice. Their controlled uniformity and built-in balance keep them cutting faster, easier and longer.

SURFACING A MACHINE TOOL BASE is easy work for a Norton cup wheel and its operator. The wheel's fast, smooth cutting action means low grinding cost and minimum operator fatigue.

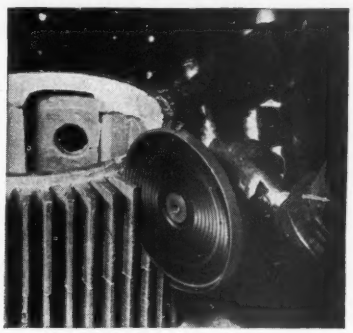
GRINDING WHEEL INSTITUTE MEMBER

Making better products to make other products better



WORK AND CUT YOUR COSTS ON JOBS LIKE THESE:

SMOOTHING UP THIS BED CASTING OF A PRINTING PRESS is a typical example of the cost-cutting performance of Norton cone wheels. They're built to take it . . . thanks to the special Norton resinoid bond.



CLEANING BETWEEN THE FINS OF THIS COMPRESSOR CASTING is an easy job with a Norton REINFORCED Hub Wheel of the rigid type — the BD. It's fast cutting, and its layers of fabric reinforcement assure maximum safety.

BLENDING IN A WELD can be done speedily with the new flexible Norton REINFORCED Hub Wheel. It's known as the Type BFR and is not only fast cutting but safe to use because of its fabric reinforcement.

NORTON
ABRASIVES

Here's where LUMNITE Concrete*

SAVED TWO WEEKS' WORK

Built to take the soaking heat of a continuous heat-treating furnace, this Heat-Resistant Concrete foundation was placed in 9 hours. Lumnite cement was used with pre-soaked Lelite aggregates.

POURED MONDAY... READY TUESDAY—That's the short, profitable story of this Heat-Resistant Concrete flue and foundation for a Wire Patent Furnace at John A. Roebling's Sons, Roebling, N. J. Their superintendent reports substantial savings on the job. And small wonder. It is estimated that by conventional methods this job would have taken about 2 weeks more to complete!

SIMPLE MONOLITHIC CONSTRUCTION is *naturally* faster than laying up thousands of small units. And Lumnite Concrete reaches service strength in 24 hours or less. That cuts outage time on both Heat-Resistant and Refractory jobs. Moreover, upkeep costs are low because Lumnite Concrete withstands severe thermal shock, resists corrosion and abrasion, and, with suitable aggregates, takes heat to 2600°F.

WHETHER YOU NEED Heat-Resistant, Refractory or Insulating Concrete, you can make it quickly, easily and economically with Lumnite calcium-aluminate cement and the proper aggregates. It has a proved time- and cost-saving record for flues and furnace foundations, and for door linings, car tops, base pads, foundry floors, stack linings and many other installations.

FOR CONVENIENCE you may prefer to buy prepared Castable mixes. These packaged mixtures of Lumnite and selected aggregates are tailor-made to meet your specific temperature and *insulation* requirements. Add only water. They're made by refractory manufacturers and sold through their dealers. For more information write: Lumnite Division, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Ave., New York 17, N. Y.

*"*LUMNITE*" *is the registered trade mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.*

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ATLAS® **LUMNITE for INDUSTRIAL CONCRETES**

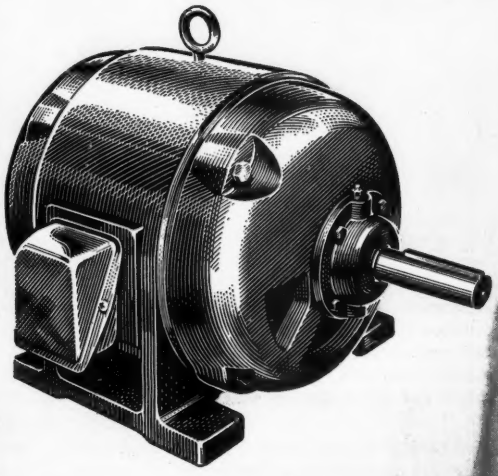
REFRACTORY, INSULATING, OVERNIGHT, CORROSION-RESISTANT

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*

ELECTRO DYNAMIC

INDUSTRIAL MOTORS

Bred for BRAWN



For over 70 years extra strength and stamina have been bred into Electro Dynamic motors to fulfill the most exacting demands of industry.

To give added years of dependable, low-cost operation, special skills and superior insulating materials are used to toughen the WINDINGS... "the heart of the motor." The frames and housings are of rugged cast construction for rigidity and resistance to corrosion.

You'll find an E. D. motor for every requirement. All standard enclosures . . . 1 to 250 h.p. *Write today for illustrated literature.*

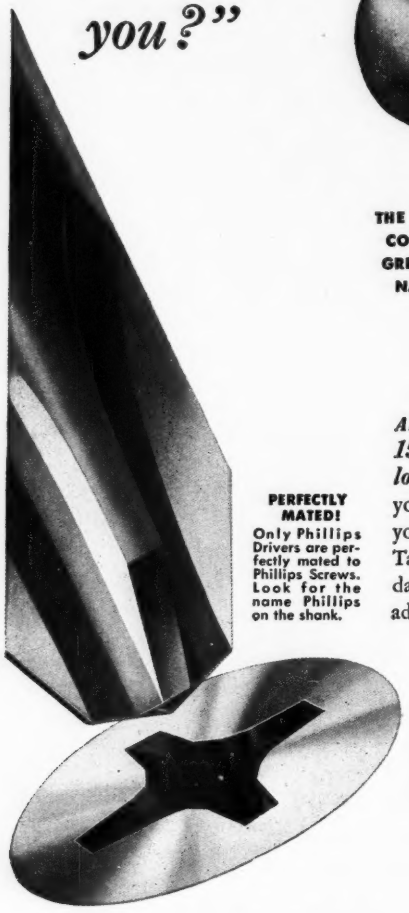
E. D. also makes a complete line of Direct Current Motors and Generators. Literature on request.

Industry has learned what marine engineers have known since 1880

ELECTRO DYNAMIC builds great motors

ELECTRO DYNAMIC • Division of Electric Boat Company • Bayonne, New Jersey

"What clue to quality can they offer you?"



PERFECTLY MATED!
Only Phillips Drivers are perfectly mated to Phillips Screws. Look for the name Phillips on the shank.

AMERICAN SCREW COMPANY • ATLANTIC SCREW WORKS, INC.
THE BLAKE & JOHNSON CO. • CAMCAR SCREW & MFG. CORP. • CENTRAL SCREW CO.
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ANSWER: Phillips Cross-Recessed-Head Screws—a clue that more than 15 million readers of The SATURDAY EVENING POST are being told to look for. When you assemble your product with these famous fasteners, you give it an *extra* mark of quality that registers on sight! Remember, too, you save time, work, and money when you use Phillips Wood, Machine, Tapping Screws or "Sems". They start faster, do away with driver skids, damaged parts, split screw heads. They set up tighter, resist vibration . . . and add structural strength. Include Phillips Screws in your specifications.

X marks the spot . . . the mark of extra quality

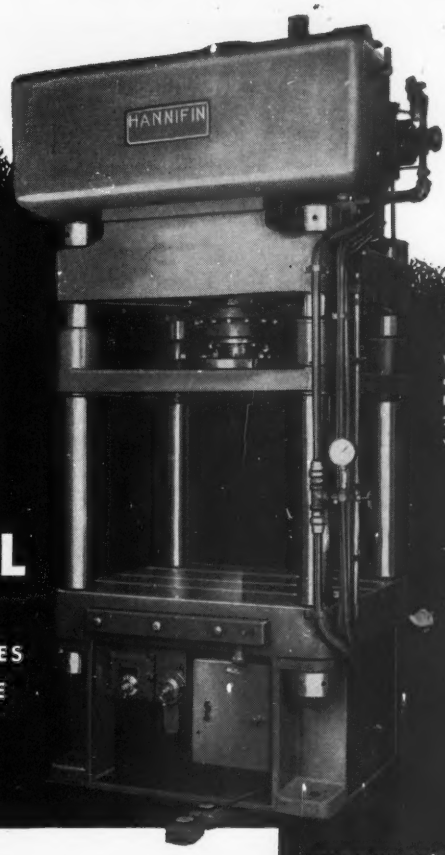
PHILLIPS *Cross-Recessed-Head* **SCREWS**

As Advertised in The Saturday Evening **POST**

THE FASTENERS OF TODAY . . . AND OF THE FUTURE

IT'S ALL A MATTER OF CONTROL

HANNIFIN HYDRAULIC PRESSES CAN BE EQUIPPED WITH THE *CONTROLS YOU NEED*



150-TON FOUR-COLUMN PRESS—Semi-automatic cycle. Advance at high speed, feed stroke starting at pre-set point in stroke and automatic reversal. Self-contained unit with reservoir, hydraulic pumps and control valves on top of press. Dual electric push buttons.

15-TON FORCING PRESS—With built-in hydraulic power unit and exclusive, patented Sensitive Pressure Control. Gap, 22"; stroke, 21"; reach, 10"; table, 19" x 22" with U slot.

HANNIFIN'S NEW HYDRAULIC "HAN-D-PRESS"—For small part assembly operations. Available in 1-ton and 2-ton sizes with pressure adjustable. Stroke, 6"; reach, 6"; gap, 10". Speeds: (1 ton) 400 ipm, advance; 800 ipm, return. Dual manual controls standard.

35-TON OPEN GAP STRAIGHTENING PRESS—One of 17 standard straightening presses. For straightening crankshafts, axle shafts, line shafts and cylinder stock. Equipped with exclusive Sensitive Pressure Control and spring-mounted, work-holding fixture on 160" rails.

When you select a hydraulic press to do a certain job—*it's the control that's all-important.* Here Hannifin excels . . . for Hannifin Hydraulic Presses are supplied with many types of control.

One outstanding Hannifin development is patented Sensitive Pressure Control . . . standard equipment on Hannifin straightening and forcing presses. But Hannifin also offers conventional manual control, adjustable for maximum pressure, and a wide range of electric push button controls. Rapid advance followed by slow feed stroke, automatic reversal on time, pre-set pressure, or distance, all are available when needed. Ram speed control can be supplied as an optional extra feature with any of these controls, and cycling can be automatic or semi-automatic.

Chances are you can select the right press, and the type of control you need, directly from Hannifin's catalog . . . it lists more than 75 models, capacities from 1 ton to 150 tons. However, if your requirements are special, a Hannifin Field Engineer will analyze them, then recommend the exact control, or combination of controls, to do the job. Why not consult with him? Hannifin Corporation, 1123 S. Kilbourn Ave., Chicago 24, Ill.

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It's an old custom in industry

BRAZING FITTINGS TO TUBING WITH EASY-FLO

• For many years it has been the vogue wherever fittings have to be attached to tubing, to braze them with EASY-FLO. The reason is simply this—this low-temperature silver brazing alloy just naturally and consistently makes the strong, permanent leak-tight joints such applications demand—and does it fast and at surprisingly low cost.

Just one example . . .

• It's the HYDRAGUIDE, the Gemmer hydraulic steering gear, used at present in Chrysler automobiles. Fittings are induction brazed to copper-coated Bundy tubing, 6 at a time, with rings of 3/64" EASY-FLO35 wire preplaced. Joints will easily take any stresses and strains the tubing itself will stand.

Photos courtesy of National Induction Heating Co. and Gemmer Mfg. Co., Detroit

BULLETIN 20 *tells why and how*

This 24-page bulletin makes crystal-clear why strong, leak-tight joints and fast, low-cost production are inherent in EASY-FLO brazing, and how to put the alloys to work. Write for a copy today.

HANDY & HARMAN FOUNDED 1867 QUALITY SERVICE
ORIGINATORS OF EASY FLO & SIL FOS

HANDY & HARMAN

General Offices: 82 Fulton St., New York 38, N.Y.

DEALERS IN PRINCIPAL CITIES

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CLEVELAND, OHIO
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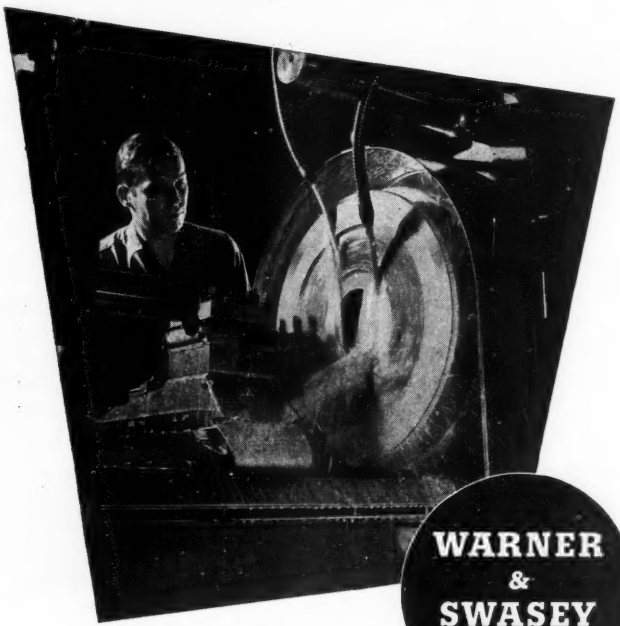
LOS ANGELES, CAL.
TORONTO, CANADA

to avoid trouble - don't invite it!

One way to avoid costly machine tool breakdowns and down-time is to head off the trouble before it starts—with a positive preventive maintenance program.

Another way—and an important one—buy the machine that is backed by an industry-wide reputation for long years of trouble-free service.

When the going gets tough—put it on the Warner & Swasey!



WARNER & SWASEY
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

HOW TO SAVE MONEY ON STAMPING RUNS OF LESS THAN 10,000

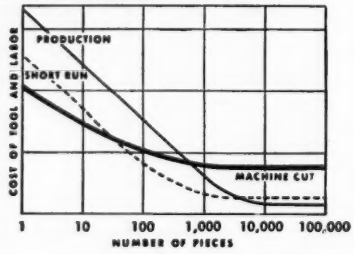
FOR EXAMPLE: TAKE THE PART ILLUSTRATED

If your total requirement is 1 to 65 parts, our Machine-Cut Method is the most economical. You pay no die costs whatsoever.

If your total requirement is for 65 to 7,000 parts, the Short Run Method using our exclusive Hecht-type dies, combined with specialized bench press operations, is most satisfactory. Die costs are extremely reasonable.

If your total requirement exceeds 7,000 parts, the standard Production Method, using the best quality dies, gives the lowest unit cost. Die costs, though higher, can be spread over a greater number of parts.

The logarithmic chart below shows the computation which the skilled Methods Engineer makes to arrive at this conclusion, for the particular part illustrated. Though the computation varies for almost every part, the general principle remains the same.



(Send today for our free, 12 page booklet full of helpful facts on buying stampings. Profusely illustrated.

. . . the exclusively short run supplier is *NOT* always the best source

The Methods Engineer, skilled in stamping practice, will tell you that a run of 10,000 or less might be produced by any one of three methods. Here's what decides which is the most economical:

1. **The quantity of each run**
2. **The *total* requirement for the part**
3. **The costs of various *types* of dies**
4. **The labor factor**

Quantity alone does not decide the method.

THE MOST IMPORTANT ECONOMY FACTOR IN BUYING STAMPINGS IN LIMITED QUANTITIES

Whenever possible, advise your stampings supplier of your total requirements. Your *second order* of the same part may justify a production-type die on the *first* order. The chart at left illustrates this. Whenever you can, avoid buying the expensive labor factor that is necessarily figured in the Machine-Cut or Short Run Methods.

Get your quotations from a stampings supplier who can impartially quote you on the most efficient production method. This will be the supplier, like our Stampings Division, who is equipped for all three!

STAMPINGS DIVISION

LAMINATED SHIM COMPANY, Inc.

3404 UNION STREET — *ESTABLISHED 1913* — GLENBROOK, CONN.

FOR EFFICIENT PRODUCTION — WHETHER ONE PART OR A MILLION

The men who handle the "mikes" and other more precise measuring instruments in our plants all have one very important idea in common: to hold strong and steady a standard of craftsmanship which has stood for a great many years.

To help them, they have every needed item of modern production and control equipment, of course. But the very root and essence of high quality in a product is still the desire of a *man* to make it that way—and that's your main reason for the long-standing reliability of Columbia and Summerill products.

W&D 3836

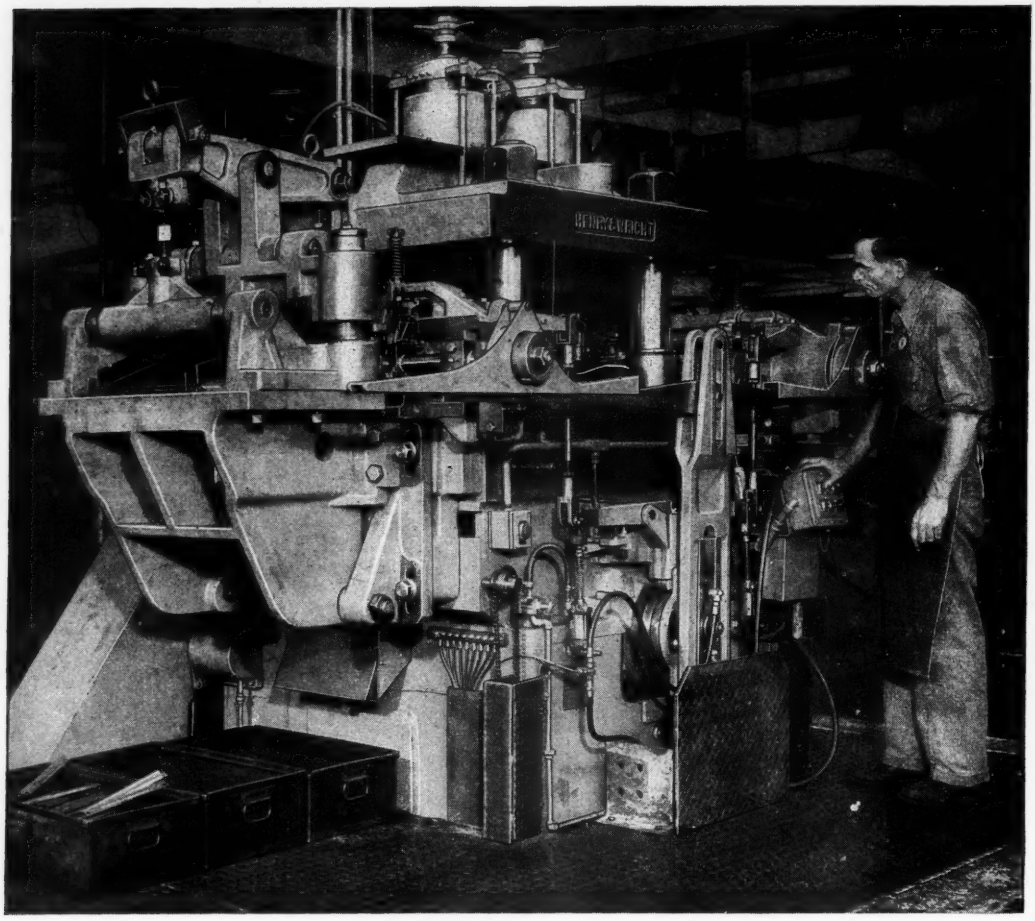
Columbia STEEL & SHAFTING COMPANY

SUMMERILL TUBING COMPANY DIVISION

PITTSBURGH 30, PENNSYLVANIA

SPECIALIZING IN COLD FINISHED STEEL BARS and SEAMLESS STEEL TUBING

H & W Dieing Machines



New, Bigger Dieing Machine is producing 4500 pieces per hour for Hart & Cooley Mfg. Co. This new 200-ton machine features basic Henry & Wright design principles:

- Flywheel, crankshaft and connection are below the punchholder instead of above.
- Low center of gravity for high speed with minimum vibration.
- Punch is pulled, not pushed.
- Maximum guiding surface — four post guide for punchholder.
- Upper crosshead takes only the pressure necessary to perform work in die — no crankshaft thrust.

OTHER EMHART PRODUCTS INCLUDE:

PREMIUM QUALITY STAMPING PRESSES
THE V & O PRESS CO.
Division of Emhart Mfg. Co.
HUDSON, NEW YORK

GLASS MAKING MACHINES
HARTFORD-EMPIRE CO.
Division of Emhart Mfg. Co.
HARTFORD 2, CONNECTICUT

AUTOMATIC PACKAGING EQUIPMENT
STANDARD-KNAPP
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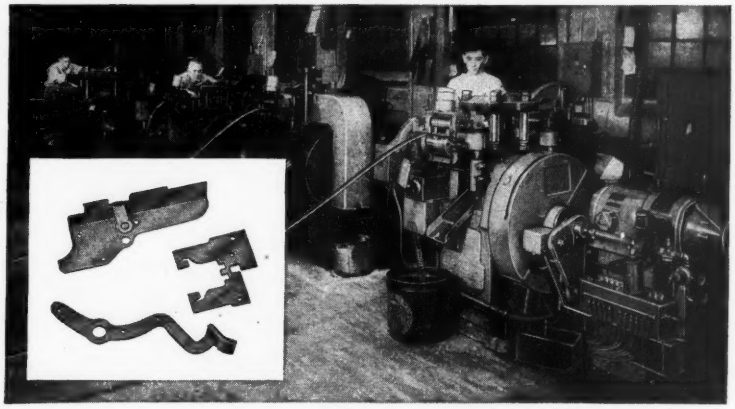
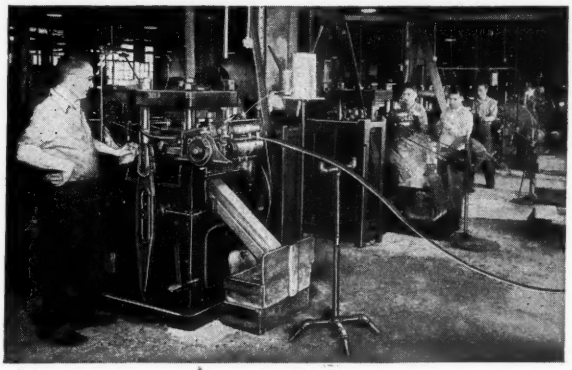
PLASTIC BOTTLES, RODS, TUBES, SPECIAL SHAPES
PLAX CORPORATION
Subsidiary of Emhart Mfg. Co.
HARTFORD 1, CONNECTICUT

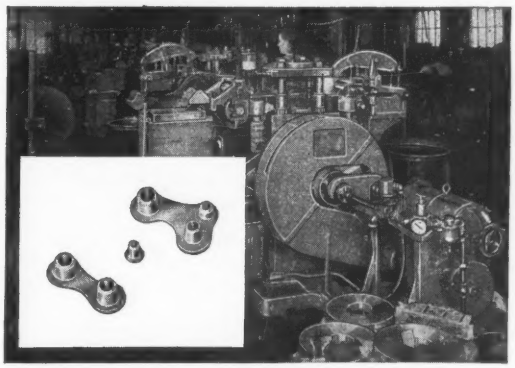
many more pieces at much less cost



Runs of 3,000 to 100,000 are produced on Henry & Wright Dieing Machines at Underwood. About 200 different typewriter parts are made on them, ranging from simple piercing and blanking to stampings produced in multiple station dies including piercing, lancing, extruding, shaving, forming and blanking with each stroke of the machine.



Thousands of Different Parts are produced on Henry & Wright Dieing Machines at the P. & F. Corbin Division of American Hardware Corporation. Variable speed drive on the H & W machines permits Corbin to select stroke rate best suited to the various types of parts.

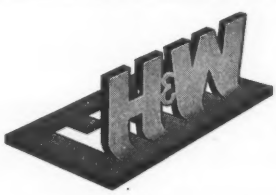


Waterbury Brass Goods Branch, American Brass Company, Waterbury, Conn., has a group of Henry & Wright Dieing Machines for formed metal parts where the quantities involved average one million pieces or more per item. Economical production costs are consistently obtained. Small parts are manufactured five at a time passing through as many as 14 die stations.

Only the best is good enough

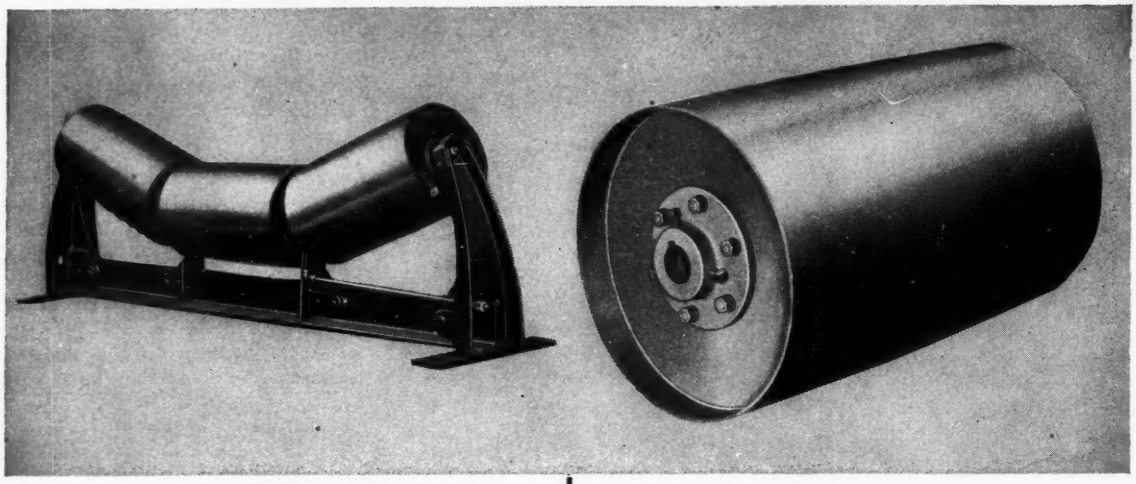
FACT PACKED CATALOG

Complete descriptions of all Henry & Wright Dieing Machines. Write: Henry & Wright, 441 Windsor St., Hartford 5, Conn.



HENRY & WRIGHT
Division of Emhart Mfg. Co.

How Belt Conveyors by LINK-BELT
cut your handling costs



LINK-BELT Idlers require minimum lubrication and adjustment

BY MINIMIZING maintenance . . . holding "down-time" to a new low . . . reducing power requirements — Link-Belt Roller Bearing Idlers save you money.

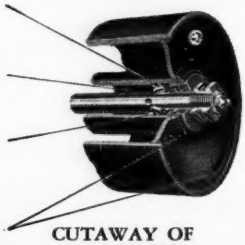
And, because of standardized design, Link-Belt gives you the famous "100" Idler or the heavy-duty "200" Idler at a cost lower than you'd expect. You can choose from the full Link-Belt line of troughing, impact-cushioning, belt training and flat belt idlers in a wide range of roll diameters and belt widths. A complete line to meet any requirement.

Grease-in dirt-out, cartridge type unit seal preserves lubricant. No springs, no loose parts, no sliding metal-to-metal contact.

Large grease reservoir prolongs lubrication intervals.

Precision roller bearings maintain alignment.

Concentrically counterbored and journaled full-length central tube and counterbored roll shell are continuously welded to dished heads to maintain balance and bearing alignment.



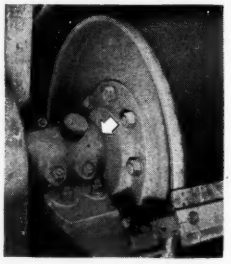
CUTAWAY OF "100" ROLL

LINK-BELT Welded Steel Pulleys minimize shaft deflection

MODERN Link-Belt welded steel design gives you lower maintenance and longer pulley life in more ways than one. Water- and dust-tight construction preserves balance, halts corrosion. Removable hubs — key-seated in line with two set-screws — are interchangeable with many other shaft sizes.

And for reducing shaft deflection (see below), you can't possibly get better protection than with Link-Belt Welded Steel Pulleys.

Since shaft bending moment increases in proportion to the distance between shaft bearing and pulley hub, it's easy to see why Link-Belt Welded Steel Pulleys are your best bet. Note how the bearing support and hub of the pulley are mounted with medium clearance. That's possible because Link-Belt hubs are flush with the pulley face.



BELT CONVEYORS

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities. 12.534

LINK-BELT

Are You Using Higher-Quality Steel than You Need?

— A call to

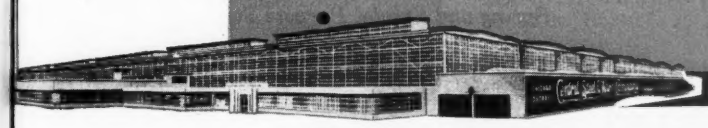
CENTRAL STEEL AND WIRE COMPANY

Might Mean Substantial Savings in Your Production Costs

With many metals in short supply, it is good business to check the quality of material you are obtaining against the end use of your product to assure satisfactory performance.

Where investigation reveals that the material is of a higher quality than is actually required, Central Steel's metallurgical staff may be able to effect considerable savings in material costs, without detracting from the properties of your finished product.

If you suspect the steel you are using is of a higher quality than may be necessary, we will welcome an opportunity to analyze your product as a basis for recommending material most suitable and economical for your purpose. No obligation to you, of course.



Hot Rolled • Cold Finished
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if you're stumped— for specialty steels!

If you play your cards right you can solve that specialty-steel supply problem. The key move is to call your nearest Crucible Warehouse!

In spite of current shortages we are maintaining good stocks on many of our more than 400 specialty steels . . .

. . . and we have *full* stocks of most tool steels!

Then, too, we get these steels to you *fast:* our strategically-located warehouses make this possible.

That's why it will pay you to turn to us whenever you need special steel.

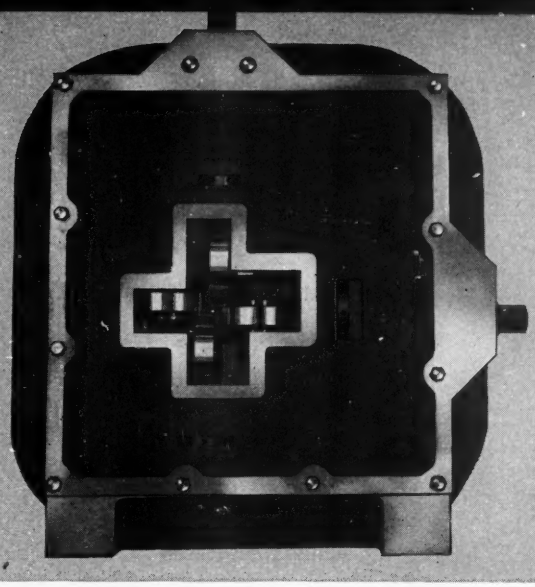
Stocks maintained of:
Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting and Plastic Die Steel, Drill Rod, Tool Bits and Hollow Drill Steel) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . AISI Alloy, Max-el Machinery, Onyx Spring and Special Purpose Steels.

CRUCIBLE first name in special purpose steels

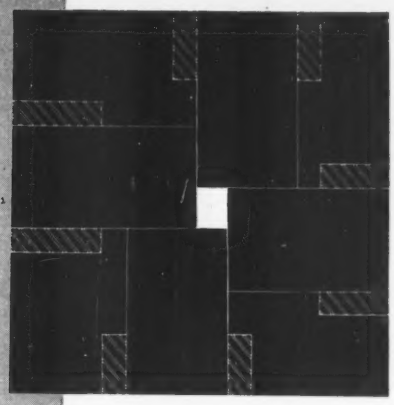
52 *years of* *Fine* *steelmaking* **WAREHOUSE SERVICE**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

Branch Offices and Warehouses: ATLANTA • BALTIMORE • BOSTON • BUFFALO • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND DENVER • DETROIT • HOUSTON • INDIANAPOLIS • LOS ANGELES • MILWAUKEE • NEWARK • NEW HAVEN • NEW YORK • PHILADELPHIA • PITTSBURGH PROVIDENCE • ROCKFORD • SAN FRANCISCO • SEATTLE • SPRINGFIELD, MASS. • ST. LOUIS • ST. PAUL • SYRACUSE • TORONTO, ONT. • WASHINGTON, D. C.



THE FENN TURKS HEAD offers many advantages over ordinary methods of shaping wire and rod. Featuring adjustable roll boxes, it *rolls* the material on both horizontal and vertical planes simultaneously. Available in friction drive or power drive.



UNIQUE FEATURE of Turks Head design is shown in this diagram of roll assembly. Four converging rolls form material to the desired shape. Square and rectangular shapes may be produced in varying dimensions by a simple roll adjustment.

Only Fenn Turks Heads bring you

MORE ACCURATE WIRE SHAPING AT LESS COST

A radical departure from the conventional draw-die, the Fenn Turks Head is characterized by the unusual operation and exceptional versatility of the die, in which the sides of the opening are four adjustable rolls. When the rod or wire is being formed into the more common square or rectangular shapes, the rolls may be adjusted to produce any width or thickness, in dimensions ranging from 0 to capacity.

EXCLUSIVE ADVANTAGES

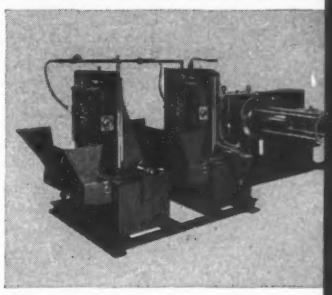
Increased Accuracy. When wire is shaped by ordinary rolling methods, the final rolling operation is apt to affect the dimensional accuracy secured by the edging process. By doing both these jobs at once — at the same point on the wire — Turks Heads eliminate this hazard. Also, since they roll *with* the work, Turks Head roll-surfaces are subjected to far less wear than rigid dies. This keeps wire sizes constant for a much longer period, to tolerances of ±.0005.

Greater Economy. Turks Heads eliminate the need for a costly inventory of stock as well as multiple dies, save the labor of frequent changing and redressing, and require less power than other methods.

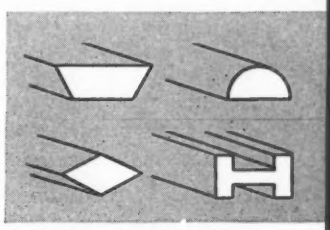
Faster. Besides their two-in-one operation, Turks Heads permit faster wire speeds.

GET THE DETAILS

on the many benefits Fenn Turks Heads can bring to your own wire-shaping operations. Contact your nearest Fenn Distributor, or write direct to THE FENN MANUFACTURING COMPANY, 1847 Broad St., Hartford 1, Conn.



FENN ROLLING MACHINES are built to take all sizes of Turks Heads, in double stand (as shown) or single stand.



ALL FROM THE SAME UNIT. Producing a wide variety of shapes from a single Turks Head is simply a matter of changing the specially ground rolls.

FENN MACHINES ARE SOLD BY:

ATLANTA
J. R. Walraven
BALTIMORE
Refer: Calco Mach'y Co., Phila.
BIRMINGHAM
Quinn & Quinn
BOSTON
Refer: Reynolds, Inc., Providence
BUFFALO
Syracuse Supply Co.
CHICAGO
Neff Kohlbusch & Bissell, Inc.
CINCINNATI
The Seifreat-Elstad Machinery Co.
CLEVELAND
Wm. K. Stamets Co.
COLUMBUS
The Seifreat-Elstad Machinery Co.
DALLAS
C. J. Harter, Machinery
DAYTON
The Seifreat-Elstad Machinery Co.
DETROIT
The Chas. A. Strelinger Co.
GRAND RAPIDS
Joseph Monahan
HOUSTON
C. J. Harter, Machinery
INDIANAPOLIS
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Tidewater Supply Co. Inc.
PHILADELPHIA
Calco Machinery Co.
PHOENIX
Hoffman & Heartt
PITTSBURGH
Wm. K. Stamets Co.
PROVIDENCE
Reynolds, Inc.
ROCHESTER
Syracuse Supply Co.
SAN FRANCISCO
C. F. Bulotti Machinery Co.
ST. LOUIS
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SEATTLE
Star Machinery Co.
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Syracuse Supply Co.
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TORONTO, WINDSOR
Williams & Wilson Ltd.
FOR EXPORT:
Indianapolis Machinery Export Co., Inc., New York, N. Y.

FENN

Forming metal for better and stronger products at lower cost

If your answer to either of these questions is YES

...call for a Simmons Rebuilding Engineer

1. Have you any heavy machine tools that are not operating at full potential (possibly due to obsolescence, missing parts or need for redesign)?

2. Do you need any big "special" machine tools... the type that take original equipment suppliers two years to build?

Examine your plant equipment again with these questions in mind. If your answer to either is "Yes", Simmons may be able to help you in two ways:

- **First,** by rebuilding used machine tools, now in your plant, for as low as 50% of the cost of new ones... and delivering them, with new-machine accuracy guaranteed, up to 300 days sooner.
- **Second,** by transforming heavy machine tools, no matter how old, into modern special-purpose units ready for 24-hour application on defense production.

You can send used machine tools to Simmons for rebuilding with complete confidence. Those who have done so during the past forty years make up a blue book of American industry. Simmons' unique rebuilding process is described in a 60-page book "The Simmons Way", a copy of which is yours for the asking. For quick action on immediate needs, call for a Simmons rebuilding engineer.

SIMMONS MACHINE TOOL CORPORATION
1755 North Broadway, Albany 1, N. Y.

SIMMONS ENGINEERED REBUILDING
Gives Machine Tools a New Lease on Life

Facts you should know about U·S·S STAINLESS STEEL

If you are using U·S·S 17 (TYPE 430) for the first time

it will pay you to familiarize yourself with its working properties

● With removal of all CMP controls from the straight-chromium Stainless Steels, U·S·S 17 (AISI Type 430) deserves your most careful attention.

In numerous cases, U·S·S 17 can be applied successfully where nickel-bearing Stainless Steels were used before; many manufacturers have already made the switch with excellent results.

The working properties of straight-chromium Stainless Steels differ in many ways from those of nickel-bearing grades. In some instances, you'll find they make fabrication more simple; in others, they may call for additional operations.

For example, U·S·S 17 has a lower tensile strength than comparable nickel-bearing grades. Hence it can be drawn, bent or sheared with less power. It does not work harden. It is easier to fabricate by spinning than are other grades.

U·S·S 17 has drawing characteristics somewhat like those of mild steel. Deep draws can be made without difficulty as exemplified by the sink shown on this page. However, more steps or operations may be required than when working with nickel-bearing grades. The same is true in the case of bending.

Welding U·S·S 17 is not difficult, and soldering is practicable if an etched or wet-table surface is provided.

These are typical differences that should be considered in changing to straight-chromium Stainless Steels like U·S·S 17. You'll find additional valuable data on the mechanical properties of these grades in our booklet, "Fabrication of U·S·S Stainless and Heat-resisting Steels." Use the coupon below.

Our local district sales offices will be glad to give you assistance in planning your production around U·S·S 17 Stainless Steel. Feel free to ask them for their help.

Straight-chromium Stainless Steels completely free of CMP controls

Since January 28, 1952, straight-chromium grades of Stainless Steel have been free of CMP controls. Action by NPA, taken in Directive 9 to CMP Regulation 1, makes it no longer necessary for purchasers of these grades to obtain CMP tickets for their requirements.

United States Steel produces three basic grades of straight-chromium Stainless Steel. They are U·S·S 12 (AISI Type 410), U·S·S 17 (Type 430) and U·S·S 27 (Type 446). Also on the list of available grades are three modifications of U·S·S 12, including U·S·S 12A1 (Type 405), U·S·S 12 Turbine (Type 403) and U·S·S 12FM (Type 416).

These grades of U·S·S Stainless Steel are being used successfully today in a wide variety of applications, including wall and roof panels, coal preparation equipment, machinery, refinery equipment, household articles, appliances, and automotive and railroad equipment.

Single draw forms this sink from Type 430 Stainless Steel

This kitchen sink, fabricated by a prominent manufacturer, is a striking example of the working properties of U·S·S 17 (Type 430) Stainless Steel.

It was formed from a 30″ x 32″ blank of 20-gage Type 430 Stainless Steel *in a single draw* without post-annealing. With an edge dimension 18″ x 20″, this represents a reduction of well over 50%.

This sink was formerly fabricated from a grade of nickel-bearing Stainless Steel. But restriction on the use of this grade turned attention to readily-available straight-chromium Stainless. It was found that this product could be fabricated from U·S·S 17 Stainless without changing the design.

This outstanding demonstration of the working properties of U·S·S 17 may indicate to you possibilities for use in your product. Our Stainless Steel engineers will be glad to help you investigate it.

United States Steel Company
525 William Penn Place, Room 2801S
Pittsburgh 30, Pa.

Please send me your booklet:
"Fabrication of U·S·S Stainless and Heat-resisting Steels."

Name..... Title.....

Address.....

City..... State.....

AMERICAN STEEL & WIRE . . . . COLUMBIA-GENEVA STEEL . . . . NATIONAL TUBE . . . . TENNESSEE COAL & IRON
UNITED STATES STEEL SUPPLY, WAREHOUSE DISTRIBUTORS . . . . Divisions of UNITED STATES STEEL COMPANY, PITTSBURGH
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

UNITED STATES STEEL

"Every man in our shop is an expert"

says James Henderson

U. S. STEEL MACHINIST

● The machine shops are vitally important at the Homestead District Works Forge Division. If you could visit them, you'd see machines that are really whoppers—like the 96-inch lathe that can turn and bore a 110-ton piece that's 8 feet in diameter, and 66 feet long. If you talked to Machinist James Henderson, who operates the lathe, the conversation might go like this:

YOU: *"How old were you when you started in the mill?"*

HENDERSON: "Fourteen. I started in the Homestead Works as a messenger in 1918."

YOU: *"How long were you a messenger?"*

HENDERSON: "Four years. Then when I was 18, I started as an apprentice machinist in the maintenance shop."

YOU: *"What kind of work did you do?"*

HENDERSON: "Practically everything. First, of course, I had to operate all the machines. It was good training, because in a big mill like this, if something broke down—a big cylinder bushing or a special bolt—we couldn't wait for outside replacements so we'd make new parts for the job. We had to work fast, too, because sometimes a whole production line would be shut down."

YOU: *"What did you do next?"*

HENDERSON: "After almost 20 years in the maintenance shop, I came here. I've been on the 96-inch lathe ever since."

YOU: *"That means you've been a machinist now for 30 years. Did you like coming to the forge department?"*

HENDERSON: "It was the greatest experience I ever had in this mill. In a way, I had to learn all over again. I remember how scared I was the first time I had to bore and ream a long hole through one of these big forgings. It was just like this job—we're boring a hole 25 feet long, to a .001" diameter tolerance."

YOU: *"Do you ever run into any trouble?"*

HENDERSON: "We sure do. Like when we're drilling a hole. You get an awful sinking feeling when the rod comes out without the drill on the end. It's a break-off. The drill breaks off and stays galled in the hole. Sometimes we spend as much as 8 hours trying to pull that drill out with special tongs."

YOU: *"I guess a mistake would be mighty expensive."*

HENDERSON: "Yes. Here, a mistake could cost thousands of dollars. But we don't make many mistakes."

YOU: *"What would you say is the most important thing about making quality forgings?"*

HENDERSON: "Well, you've got to have the steel and the machines. But I think the men are most important. Like here, the furnace man, pressman, machinist, and heat treater all have to work together. Any one man can foul up a job. We almost never have trouble, so I figure almost every man in the shop is an expert."

• • •

When you buy forgings from United States Steel Company, men like James Henderson work on them. We'll match their work against the finest in the land. For more information on U·S·S Quality Forgings, write to United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pa.

USS

Quality

FORGINGS

heavy machinery parts—carbon, alloy, stainless

electrical and water wheel shafts

hammer bases and columns

marine forgings

Facts you should know about U·S·S

Because of proved ability to save weight and increase life

MECHANICAL HANDLING SYSTEMS INC. FINDS NEW USES

As is so often the case, the excellent results obtained with U·S·S High Strength Steels in one line of products has led this manufacturer to utilize the superior properties of these steels for his other lines.

HERE'S the story as told us by Mr. E. Mullen, Production Manager of Mechanical Handling Systems Inc., Detroit, Michigan.:

"We've been working with U·S·S High Strength Steels since 1940. After the war when we decided to bring our line of auto-carriers up to date, the problem was to materially reduce weight without reducing strength or stamina—and without increasing costs. By careful redesign of the trailer body and by building with U·S·S COR-TEN steel, one gage lighter than mild steel previously used, 2000 pounds of dead-weight were eliminated.

"These lighter trailers performed extremely well under constant service and paid off for users by reducing oil and gas consumption and by extending the life of tires and brakes. What was equally important, the high strength steel was easy to fabricate, and because less steel was required, our costs were not materially increased.

"Similar worth-while results were obtained when we redesigned our auto-loading skids. Built with U·S·S COR-TEN they weighed only 70% of former carbon steel construction, had strength to spare, and cost no more than before.

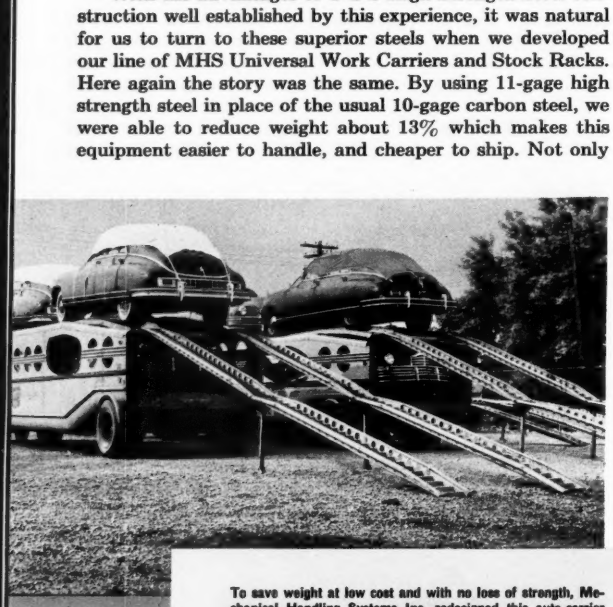
"With the advantages of U·S·S High Strength Steel construction well established by this experience, it was natural for us to turn to these superior steels when we developed our line of MHS Universal Work Carriers and Stock Racks. Here again the story was the same. By using 11-gage high strength steel in place of the usual 10-gage carbon steel, we were able to reduce weight about 13% which makes this equipment easier to handle, and cheaper to ship. Not only is this lighter construction just as strong or stronger than ordinary heavy carbon steel but it has greater ability to resist shock loads, wear, abrasion and atmospheric corrosion —important assets in equipment that is subjected to heavy loading, and rough handling and is often exposed to the weather for long periods when used for outside storage.

"Our men have found U·S·S High Strength Steels easy to handle in fabrication. Although we anticipated welding and forming difficulties, we have had none whatsoever. In fact, certain die cut-off operations have been accomplished better than with the softer mild steel. And what's important in this very competitive field, our costs are right in line. To sum it up, by standardizing on U·S·S High Strength Steels we are able to give our customers an all-round better product, that lasts longer, is easier and cheaper to use and costs no more to buy."

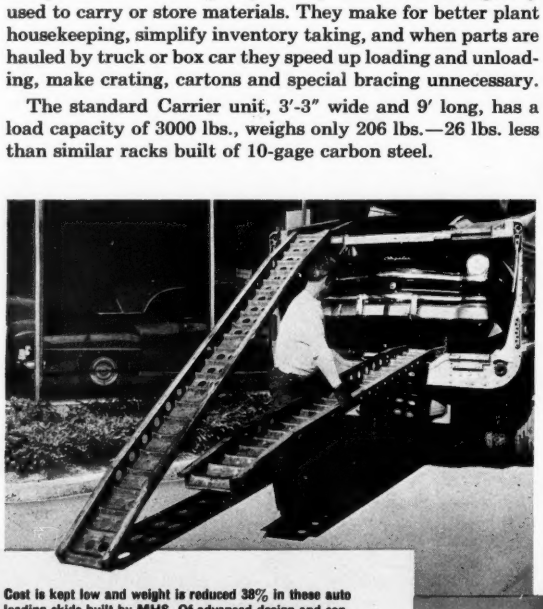
Now, square tubing of U·S·S High Strength Steel *formed from coiled strip in one continuous operation* provides the basic structural element for MHS Universal Work Carriers.

THE prime function of MHS Universal Carriers is to minimize time, labor and damage in the handling, storing and shipping of materials, sub-assemblies and manufactured parts of all kinds. Designed to eliminate waste space, and easily stacked to ceiling height, they can be interchangeably used to carry or store materials. They make for better plant housekeeping, simplify inventory taking, and when parts are hauled by truck or box car they speed up loading and unloading, make crating, cartons and special bracing unnecessary.

The standard Carrier unit, 3'-3" wide and 9' long, has a load capacity of 3000 lbs., weighs only 206 lbs.—26 lbs. less than similar racks built of 10-gage carbon steel.



To save weight at low cost and with no loss of strength, Mechanical Handling Systems Inc. redesigned this auto-carrier body and by building with easily fabricated, high strength U·S·S COR-TEN reduced its weight one ton. The 2000 lbs. of steel saved in each unit made it possible to build 13 bodies instead of 9 from the same total tonnage of steel.



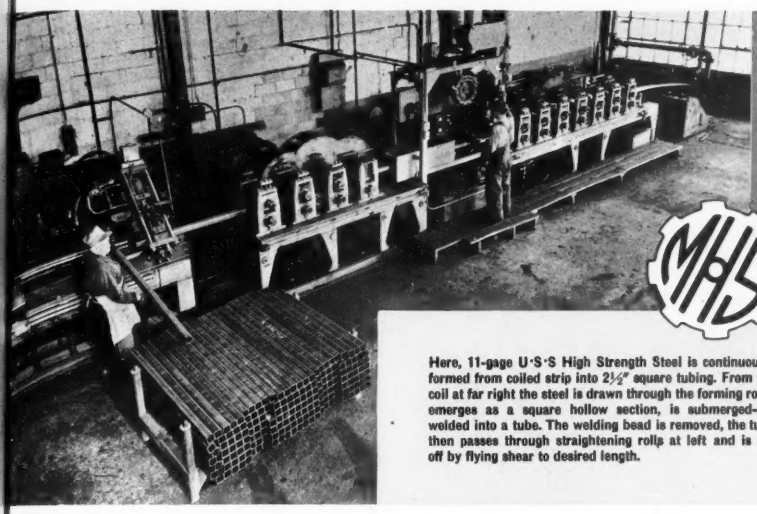
Cost is kept low and weight is reduced 38% in these auto loading skids built by MHS. Of advanced design and constructed with U·S·S COR-TEN, they weigh only 95 lbs. each instead of 154 lbs. required when built of carbon steel . . . save weight, save work, save steel.

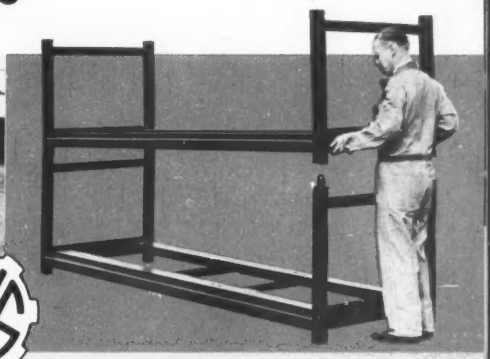
HIGH STRENGTH STEELS

USS TRADE MARK HIGH STRENGTH STEEL UNITED STATES STEEL

without increasing cost

FOR U·S·S HIGH STRENGTH STEELS





Here, 11-gage U·S·S High Strength Steel is continuously formed from coiled strip into 2½" square tubing. From the coil at far right the steel is drawn through the forming rolls, emerges as a square hollow section, is submerged-arc welded into a tube. The welding bead is removed, the tube then passes through straightening rolls at left and is cut off by flying shear to desired length.

Light, strong and durable square tubular sections of U·S·S High Strength Steel provide the basic structural elements of MHS Universal Work Carriers. As shown, the Carrier racks can be readily stacked. A removable end frame permits easy knockdown and compact nesting when carriers, after shipment by box car or truck, are returned empty.

To obtain this combination of great strength and lighter weight, and to keep costs low, Universal Carriers are built of 2½" square tubing, formed of 11-gage U·S·S High Strength Steel strip on a roll-forming machine.

Fabricating operations are simple, continuous and fast. The steel received in wide coiled sheets is first slit into coiled strips of proper width. On the roll machine this coil strip is cold formed, into the square tubular shape, is submerged-arc welded and cut to desired length by flying shear. The weld flash is then removed and tubes sent through a series of straightening rolls; necessary assembly holes are punched and the finished tubes are ready for welding into racks.

• • •

In these operations the use of U·S·S High Strength Steel contributes important benefits. Not only does it permit a substantial reduction in weight with no loss of strength but because its mechanical properties are uniform in shipment after shipment, once the equipment is set up for this steel, forming, welding, cut-off and other fabricating operations proceed, smoothly, at high speed with minimum rejection loss.

Lift truck quickly and efficiently moves and stacks MHS Work Carrier racks. Construction with U·S·S High Strength Steel reduces weight yet gives the racks strength to spare, insures high resistance to abrasion, wear and impact, provides added resistance to atmospheric corrosion which prolongs life when racks are stored outdoors.

USS

United States Steel Company
525 William Penn Place, Room 2801S
Pittsburgh 30, Pennsylvania

Please send me a copy of your book "U·S·S MAN-TEN."

Name..... Title.....

Company.....

Address.....

City..... State.....

AMERICAN STEEL & WIRE . . . . COLUMBIA-GENEVA STEEL . . . . NATIONAL TUBE . . . . TENNESSEE COAL & IRON
UNITED STATES STEEL SUPPLY, WAREHOUSE DISTRIBUTORS . . . . Divisions of UNITED STATES STEEL COMPANY, PITTSBURGH
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

Facts you should know about

U·S·S CARILLOY STEELS

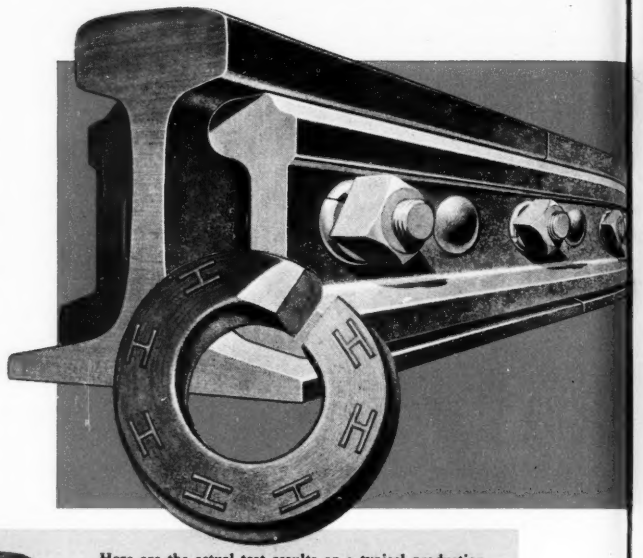
18,000,000 Carilloy spring washers used without one reported failure!

thanks to

U·S·S metallurgical assistance

HUBBARD & COMPANY, Tool Division, Pittsburgh, Pa., is a major producer of rail joint spring washers. These vital washers are used on the bolts of the joint bars that connect sections of railroad rails. Battering and wear at the rail ends is reduced due to the high bolt tension caused by the reactive pressure of these CARILLOY steel washers.

Some time ago, our metallurgists got together with Hubbard engineers and came up with a vastly improved method of heat treating these alloy steel washers. This heat treating system has achieved uniform heating, precisely timed quenching and fool-proof tempering. Result: a higher quality product, more uniform than ever before.



Here are the actual test results on a typical production run at Hubbard & Company. At left is the finished washer ready for delivery. Middle picture shows the washer after the 90° twist test required by specifications. As shown at the right, Hubbard spring washers will consistently withstand a twist test far greater than required.

At Hubbard, this variable speed conveyor removes spring washers from the quench tank on a precise time cycle.

Here's what B. J. McTighe, Superintendent of Hubbard's Tool Division says:

"Since installing our new heat treating system, we've sold about 18,000,000 spring washers without one reported failure. The improved heat treatment, suggested by United States Steel, has resulted in more uniform structure, better mechanical properties and a retention of spring properties under all conditions.

"These spiral spring washers, made from CARILLOY 9260 steel, are hardened to an average of 49/52 Rockwell C. Despite this high hardness, the washers easily meet the specification requiring a 90° cold twist in the fully heat treated condition. Our own shop control limits are even more severe than this to make sure that we meet and exceed railroad standards. We think the superior performance is due to our improved heat treating system."

If you're having trouble handling lean alloys, we may be able to suggest heat treatment methods that will give you more uniform hardness, less rejects and less retreatments. Simply call or write our nearest district sales office.

USS

COLUMBIA-GENEVA STEEL . . . . TENNESSEE COAL & IRON . . . . UNITED STATES STEEL SUPPLY, WAREHOUSE DISTRIBUTORS

Divisions of **UNITED STATES STEEL COMPANY, PITTSBURGH**

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

HANSEN COUPLINGS

GIVE YOU 2 *Big Advantages*

1. QUICK CONNECTION AND DISCONNECTION

2. INSTANT AUTOMATIC FLOW OR SHUT-OFF

With Hansen couplings you save precious minutes every time you connect or disconnect a fluid line carrying gas, liquid or grease.

To connect, you merely push plug into socket—flow starts instantly. To disconnect, pull back sleeve on socket, coupling disconnects. Flow is shut off instantly and automatically.

From a wide range of available sizes and types, you can select a Hansen coupling exactly suitable for your application—each type engineered to meet its specific requirements.

WRITE FOR CATALOG

QUICK-CONNECTIVE COUPLINGS for AIR
ACETYLENE • OIL • GREASES • GASES
VACUUM • STEAM • OXYGEN • HYDRAULIC

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BALTIMORE • BIRMINGHAM • CHICAGO
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Export Department: CLEVELAND

QUICK CONNECTIVE FLUID LINE COUPLINGS . . .

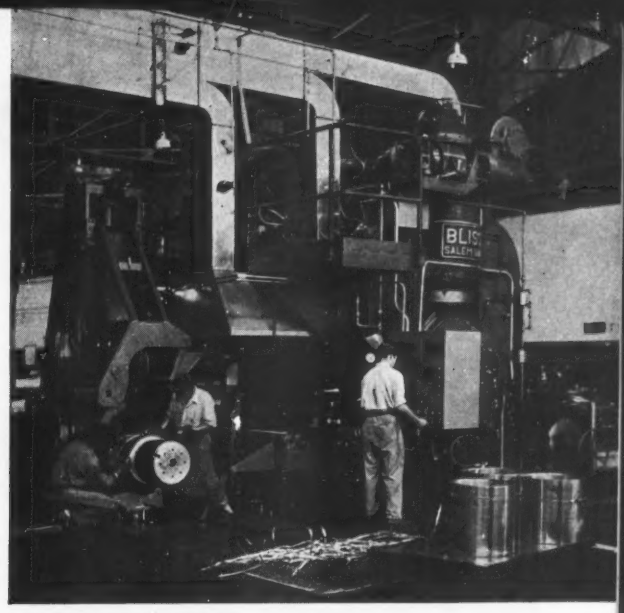
THE HANSEN MANUFACTURING COMPANY

4031 WEST 150th STREET • CLEVELAND 11, OHIO

MEXICO'S First 4-High

Native operators at Aluminio Industrial Mexicano are sticking the Bliss mill with a relatively heavy-gage stock. They are aided by the entry back-tension bridle which offers mechanical advantage. Note horizontal duct runs of the fog exhaust system for localizing and evacuating rolling fumes.

Heavy gage coil is banded to prevent unwinding. Mill was designed to accommodate heavy and light gages of aluminum alloys.



Mill Is Bliss Built

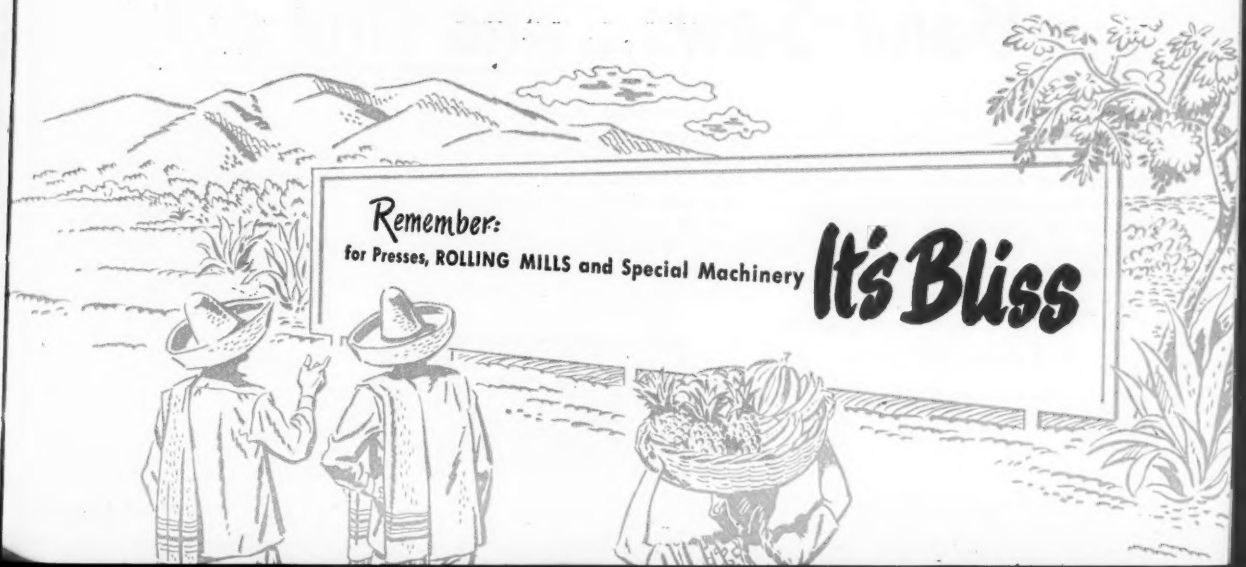
When Aluminio Industrial Mexicano, S. A., put its new four-high mill through its paces, it marked another success for Bliss rolling mill engineers. For Bliss created this versatile production unit, custom designed it for heavy and light gage rolling, and operation maintenance by native employees.

Built for both intermediate and finish rolling of aluminum alloy coiled sheet stock, the mill is equipped to give reductions up to 50% at speeds to 350 spm. Starting gage 0.100″ is generally run down to 0.019″ in 40″ widths. Complete installation includes pay-off reel, entry tension bridle, belt wrapper and tension reel rewind with unloader.

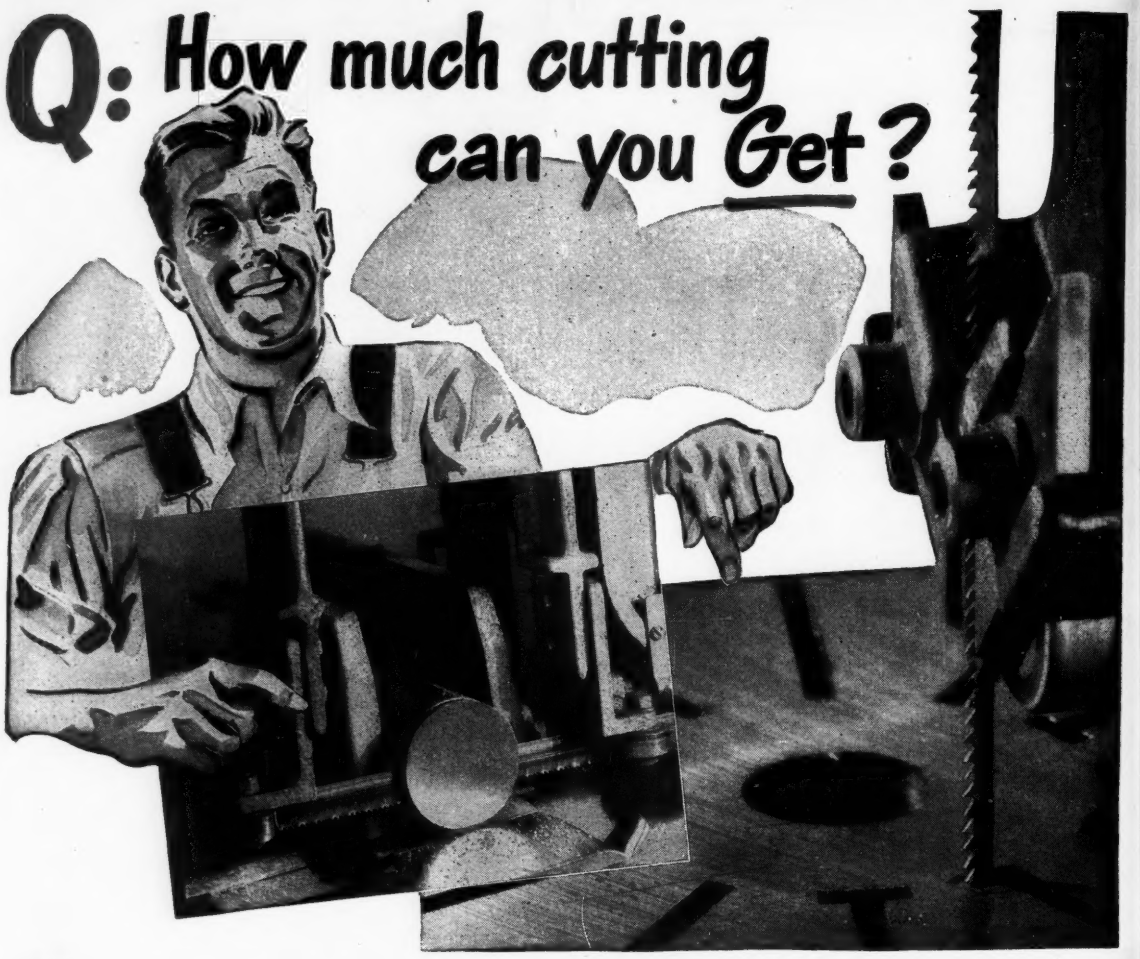
Plant officials at Aluminio report full satisfaction with the Bliss mill, the first four-high to be installed in Mexico. They find the motorized roll changer for back-up rolls "fast and convenient"...say "the unit is well tailored for local considerations... atmospheric conditions, altitude...operation and maintenance by locally-trained personnel."

You will find similar Bliss case histories in major steel, aluminum and brass mills everywhere. Whether it's a multiple-stand tandem hot mill or an important accessory machine, Bliss engineers are interested in working with you. A good idea of the experience you draw on can be seen in Bliss' new 52-page Rolling Mill Brochure. Write for your copy today.

E. W. BLISS COMPANY, CANTON, OHIO
ROLLING MILL DIVISION: SALEM, OHIO
E. W. Bliss (England), Ltd., Derby, England
E. W. Bliss Company (Paris), St. Ouen sur Seine, France



Q: How much cutting can you Get?



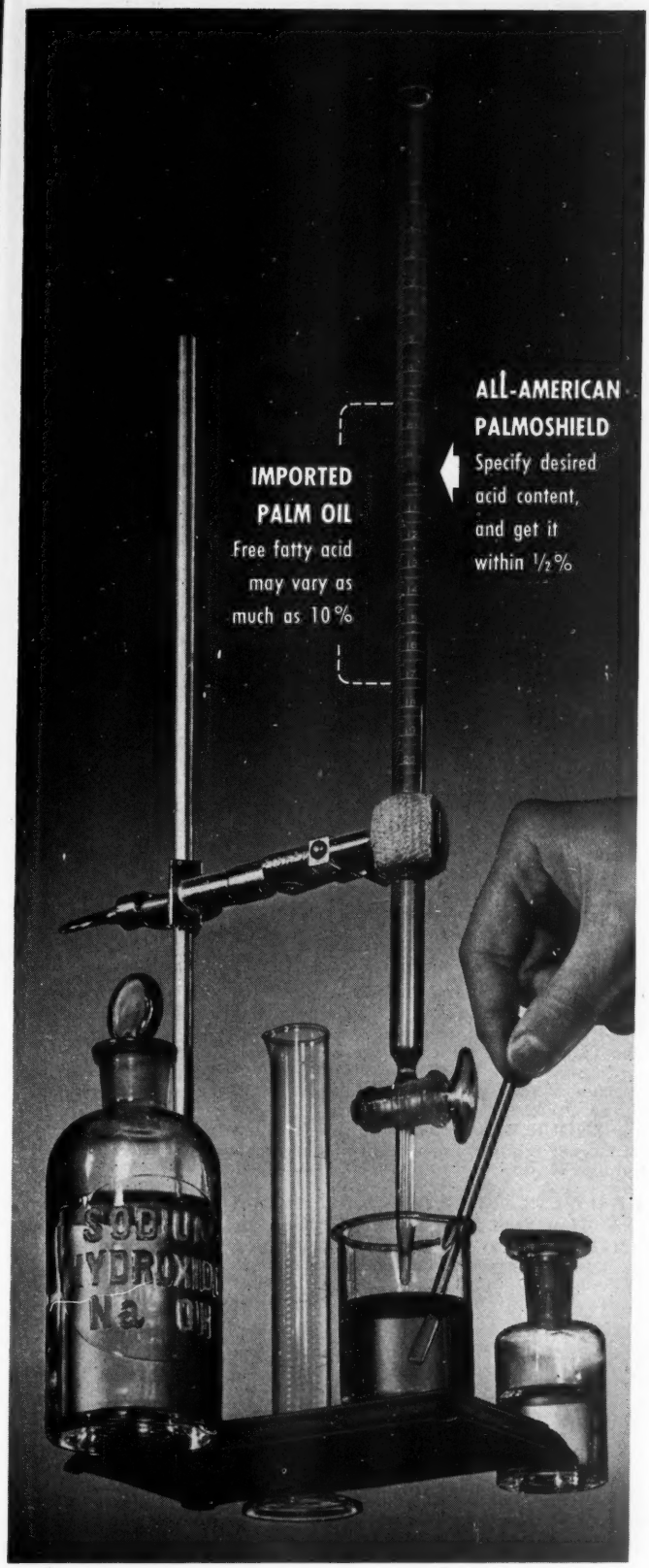
A: Get SIMONDS Metal-Cutting Band-Saws... and find out!

No matter what kind of tough cutting job you're up against, you can't beat these bands for long, trouble-free service. Uniform tooth-set and temper assure fast, smooth cutting. And longest saw-life is assured by special heat-treatment of the back of the saw in order to prevent stretch, weaving in the cut, and cracking of gullets.

Simonds Metal-Cutting Band Saws are furnished with *Standard Tooth* (regular or wavy set) . . . and *Skip Tooth* for cutting plastics, wood, aluminum, and other soft materials. All widths are now packed in handy 100′ containers, and in coils of 300′ . . . or welded to exact machine-length. Get delivery from stock from your local Simonds Distributor . . . call him today.

Factory Branches in Boston, Chicago, San Francisco and Portland, Ore. Canadian Factory in Montreal, Que.

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.



Now you can *specify free fatty acid content to ½%* ... and get it!

If you use imported palm oil in rolling operations, probably one of your biggest headaches is the wide spread from batch to batch in free fatty acid content, often as much as 10%.

With too high an acid content both your emulsion and your cleaner formulas may be thrown out of balance. And of course *any* wide variation from specifications can play hob with uniform performance and production control.

With Palmoshield, new all-American replacement for palm oil, you get the acid content you specify within ½% (± ½%).

Since Palmoshield is a scientific product. man-made from domestic materials, it is subject to exact chemical control. You can specify your preferred free fatty acid content on delivery, and you are assured this percentage will not change under normal storage.

Equally important in these uncertain times is the fact that Palmoshield is an all-American product made from freely available domestic materials. Users are not dependent on overseas shipment from foreign-controlled sources. A call to Ironsides in centrally located Columbus brings immediate shipment.

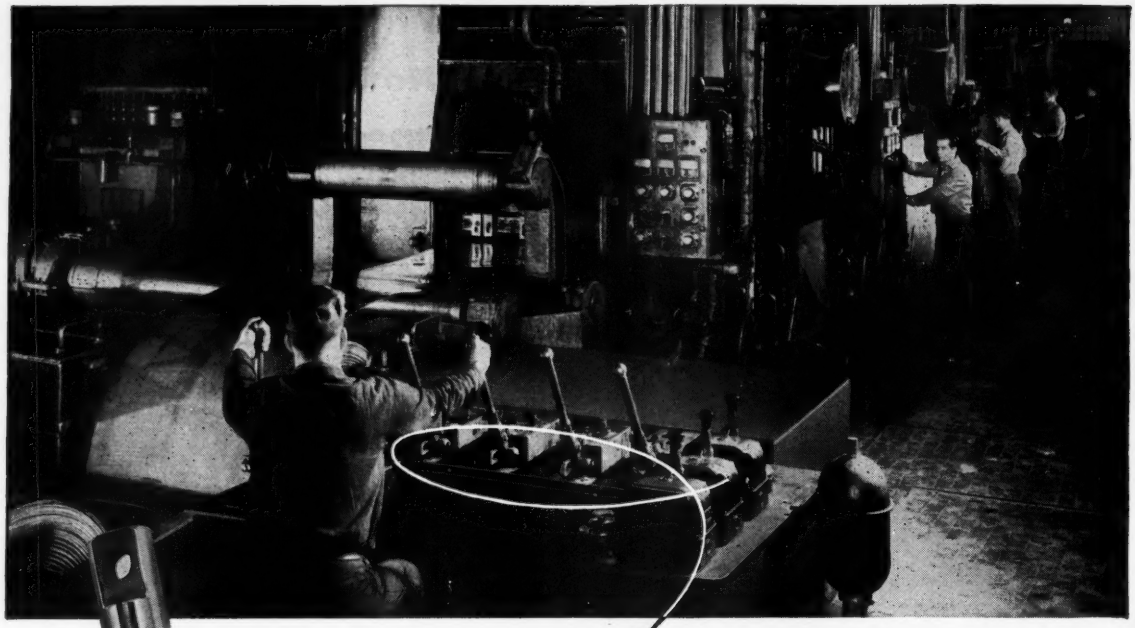
Palmoshield has been under test for three years in cold rolling steel production under standard operating conditions. Results show that the new lubricant duplicates the chemical characteristics of the imported product and that it is in certain ways superior.

Palmoshield is already in successful use in several leading rolling mills. It is available for immediate shipment in 55-gallon drums and in tank car lots. Competitively priced. For full details call or write The Ironsides Company, 270 West Mound Street, Columbus, Ohio.

SPECIAL LUBRICANTS *and* PRESERVATIVES

SHIELD PRODUCTS

IRONSIDES
PALMOSHIELD



Free-Machining ENDURO Helps Control Stainless Machining Costs

Half-inch and three-quarter-inch plungers for Hunt "Quick-As-Wink" control valves are machined from Type 416 Free-Machining ENDURO Stainless Steel by C. B. Hunt & Son, Inc., Salem, Ohio.

In pneumatic and hydraulic control valves, ENDURO Stainless Steel plungers help boss big mills like this . . .

The ENDURO plungers—through which air, water, and oil flow under thousands of pounds pressure — must resist corrosion, resist abrasion, and maintain a tight seal at all times. They must be fully balanced so that they cannot creep or crawl.

All this requires a lot of machining . . . upwards of 30 separate operations.

Free-Machining ENDURO Bars are cold finished by Republic's Union Drawn Division especially for efficient, economical production of all such highly-machined parts. They provide close tolerances, accuracy of section, uniform soundness, and fine surface finish, together with the high physical and chemical properties of stainless steel. Two grades are 90% as machinable as Bessemer screw stock.

Free-Machining ENDURO also is available in hot rolled bars, and in wire. Republic metallurgists are ready to give prompt assistance on applications, processing and use. Write:

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

Republic ENDURO® FREE-MACHINING STAINLESS STEEL

REPUBLIC STEEL®

Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

PATENTED

Model 53 KLOZURE Oil Seal—an efficient general purpose seal for high speeds. Also many other models. Complete range of sizes.

Garlock KLOZURE* OIL SEALS For All Types of Bearings

*REGISTERED TRADEMARK

THEY'RE TOUGH

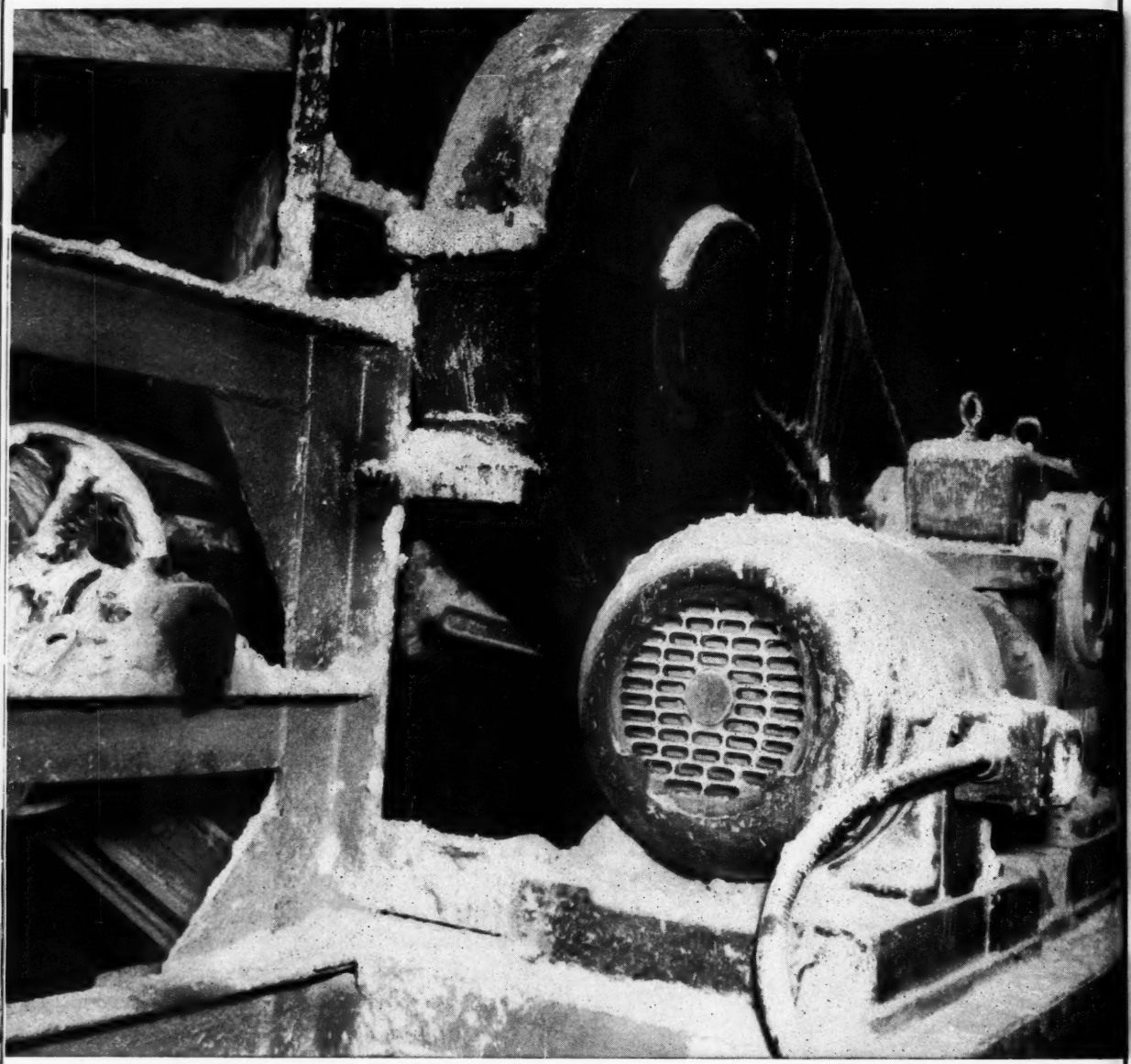
DEPENDABLE

GARLOCK KLOZURE Oil Seals are tough and durable. They resist oil and heat; keep dust, dirt and water out of the bearings—and keep oil and grease in. They give superior performance on high or low shaft speeds. The KLOZURE sealing ring stays firm and resilient even after long service. For dependability, efficiency and economy, protect your bearings with GARLOCK KLOZURES.

THRIFTY, TOO!

THE GARLOCK PACKING COMPANY, PALMYRA, N. Y.
In Canada: The Garlock Packing Company of Canada Ltd., Toronto, Ont.

INDUSTRY DOES THE T



THE CHEMICAL INDUSTRY depends on standard, "off the shelf," Tri-Clad motors in the most adverse operating conditions, including corrosive, abrasive and explosive atmospheres. The 7½-hp totally-enclosed fan-cooled Tri-Clad motor above drives a crude ash conveyor an average of over 23 hours every day.

GENERAL ELECTRIC

752-12

E TOUGH JOBS WITH TRI/CLAD MOTORS

REG. U.S. PAT. OFF.

EXTRA PROTECTION

Every Tri-Clad motor, open or totally-enclosed, is triply-protected against *physical damage, electrical breakdown* and *operating wear and tear.*

That's why you'll find general-purpose Tri-Clad motors in every industry—not only on the usual jobs which they do so economically—but on the *tough* jobs where unfailing performance is a must.

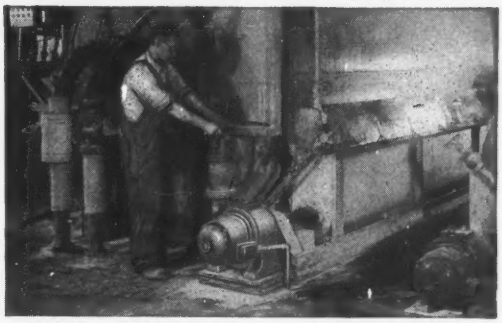
PROMPT DELIVERY

Today especially, delivery and service are important. G-E shipping points all over the country are ready to deliver most standard ratings right out of stock. And with the most complete service shop network in the motor industry you are assured of the best attention to motor problems.

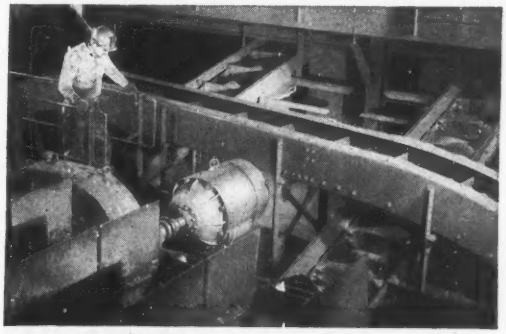
TIMELY INFORMATION AVAILABLE

If you are concerned with training manpower, the new G-E Motor Selection and Application Course, including nine strip films, is a unique and valuable aid. A sample copy of the "Instructor's Manual" (GEZ-310), which outlines the course, may be obtained on request.

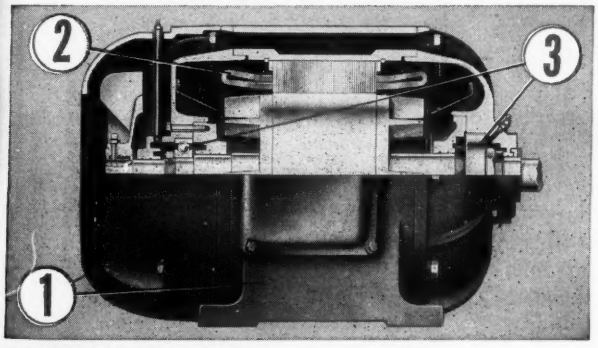
Also available is a free bulletin on "How to Maintain Motors and Generators" (GET-1202). Contact your local G-E sales office for any of the above material, or write *Section 752-12, General Electric Co., Schenectady 5, N. Y.*



FOOD PLANTS on "continuous process" operation depend on Tri-Clad motors to avoid costly shut-downs. Totally-enclosed, non-ventilated Tri-Clad gear-motor above drives a repulper in a sugar refinery.

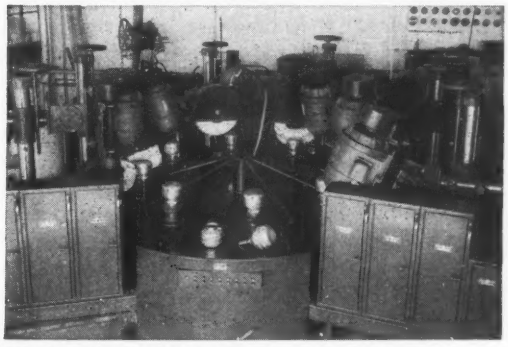


MINING INDUSTRIES know Tri-Clad motors can take abuse, don't twist out of line and are corrosion-resistant. This totally-enclosed, fan-cooled, Tri-Clad motor runs a coal conveyor.

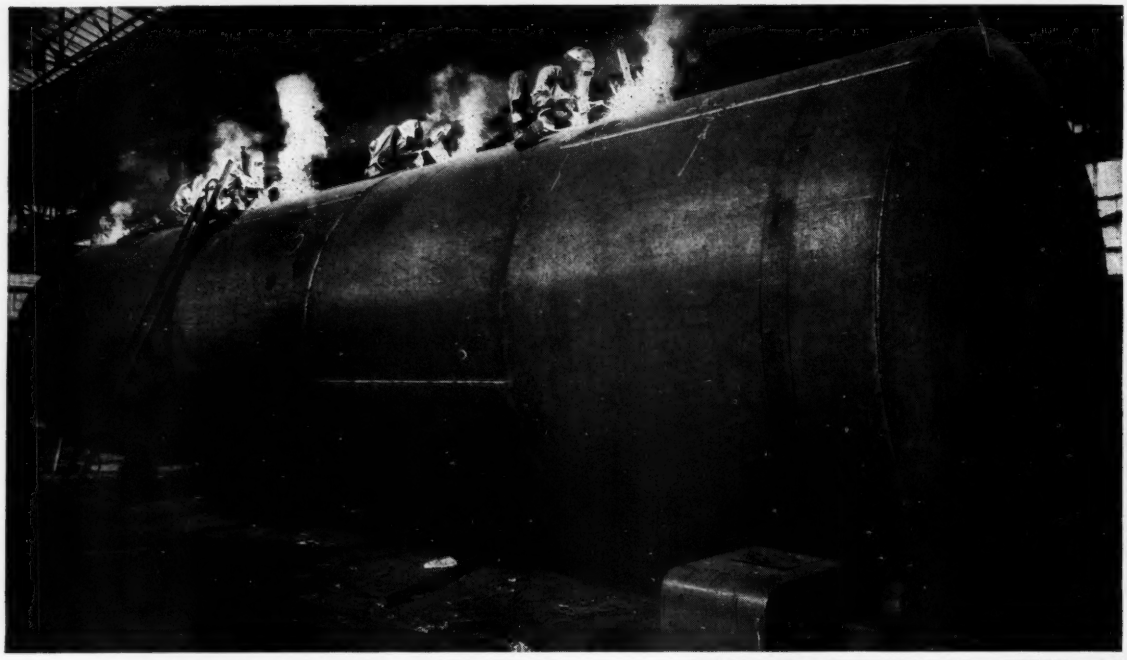


UNINTERRUPTED SERVICE under tough conditions is assured by many outstanding features of Tri-Clad totally-enclosed motors, for example: 1 rigid, cast-iron end shields and frame; 2 Formex* windings which resist oil, heat, shock, moisture, abrasion; 3 *completely* enclosed bearings that will last longer because provision is made for relubrication if necessary.

Reg. trademark of General Electric Co.



METAL WORKING FIELD likes Tri-Clad motors because they're easy to mount in any position, rigid and smooth running, and *can be relubricated if operating conditions warrant—without disassembly!* Six 7½-hp TEFC Tri-Clad motors run machine above which polishes 500 to 1000 metal coffee-makers per hour!



WORTHINGTON TURNING ROLLS IN OPERATION move this big tank at exactly the right speed for the most efficient downhand welding. This equipment often increases output as much as 50% because downhand welding with heavier electrodes does the job with one pass instead of two or three.

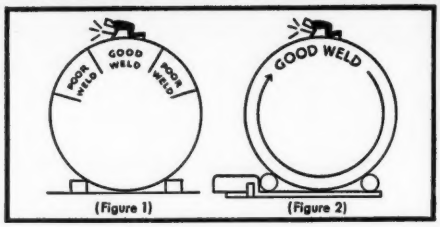
A way to lower your welding costs as much as 50%

If you are welding cylindrical vessels of any size, you can lower costs and increase welding footage as much as 50% with Worthington Turning Rolls.

Your welders can produce more *real footage* by eliminating time wasted in manually turning the vessel or waiting for crane or hoist service.

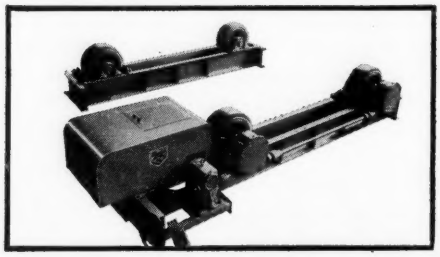
You'll get neater, stronger welds and less rod waste, too. The Worthington Turning Roll power turns the vessel at selected welding speeds for quickest spotting of longitudinal seams and continuous welding of circumferential seams. All welds can be made by the convenient downhand method with the economies that result from larger electrodes used.

Where can you see a Worthington Turning Roll at work near you? Just write Worthington Pump and Machinery Corporation, Dunellen, N. J., for this information or for Bulletin 210C.



WHY WORTHINGTON TURNING ROLLS INSURE BETTER WELDS

Unless the work is turned continuously, good downhand welding is obtainable only in small area (Fig. 1). With a Worthington Turning Roll, downhand welding is assured for the complete circumferential seam (either by manual or automatic welding) (Fig. 2).



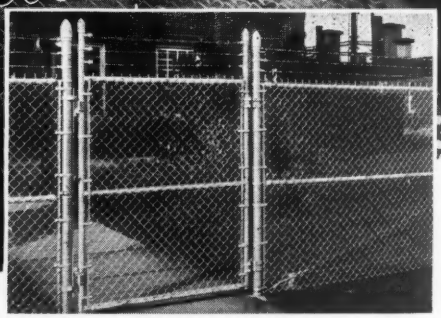
WORTHINGTON'S LOW-SLUNG DRIVE MECHANISM permits unobstructed loading from either end of turning rolls. The high-efficiency and smooth operation of Worthington power rolls (lower right) and idler rolls (upper left) result from long and varied experience in building equipment for welding cylindrical vessels.

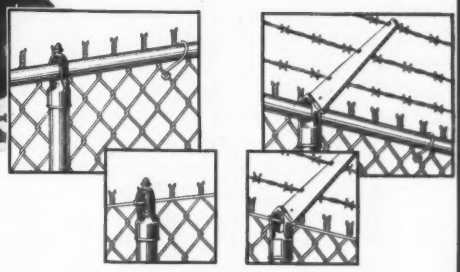
Y.1.3

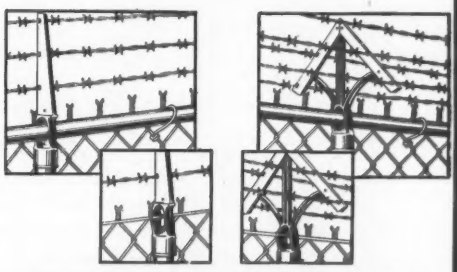
WORTHINGTON

Welding Positioners
Turning Rolls

Here's What It Takes For Better Property Protection





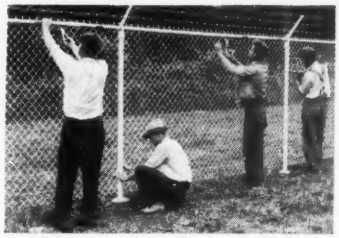


12 STYLES TO CHOOSE FROM

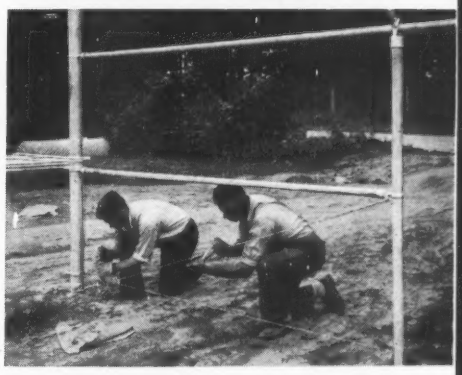
CONTINENTAL Chain Link Fence provides better protection features—more value for your fence dollar. You get Continental's engineered fence erection . . . planning and installation of one of twelve fence styles. You get Continental's rigid framework—heavy, closely spaced line posts, braced and secured by tough rods and wire. You get Continental's rugged fabric . . . weather-proofed by a hot zinc bath, after weaving, for maximum rust resistance. And you get Continental's easy swinging, welded gates, on new pivot hinges. That's what you get with Continental fence, and that's what it takes for better, longer-lasting property protection.

TAILORED TO FIT EACH SPECIFIC INSTALLATION

Continental's experienced fence engineers help you plan and lay out fence, tailored to fit your property.



Line posts are solidly set in concrete—fabric carefully stretched and secured for permanence.



ERECTION FOR PERMANENCE

* TRADE MARK REG. U. S. PAT. OFF.

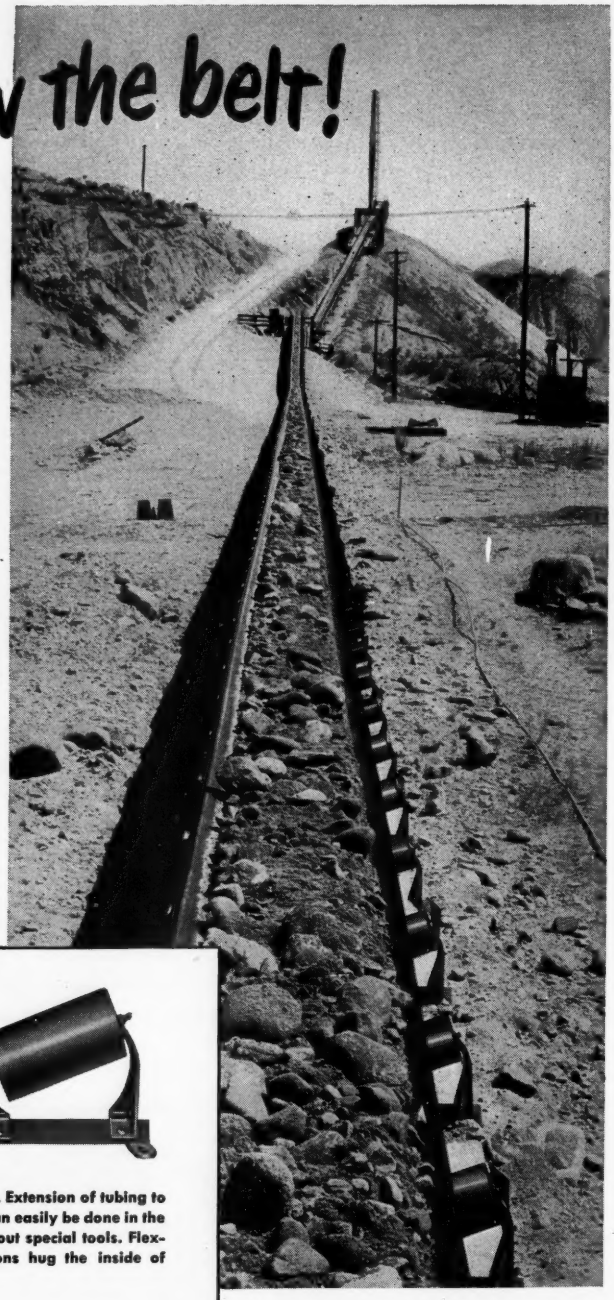
CONTINENTAL STEEL

CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* **in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.**

a big "hit" below the belt!



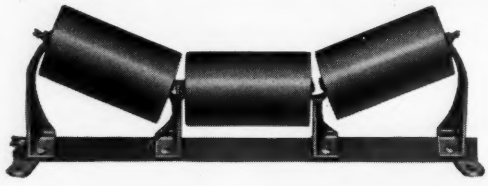
Nearly everyone realizes the advantages of belt conveyors for low-cost transportation of bulk materials. But what goes on below the belt is, perhaps, too often taken for granted. Certainly, the belt idler, more than any other piece of equipment, is responsible for the low cost of belt conveying per ton of material handled.

That's why Rex® Idlers are so often specified. Rex has been the leader in idler design and construction for over 25 years and sets the standard that others are working toward.

An idler must "keep rolling." If it freezes up, the belt will quickly wear through the roll, leaving sharp edges to cut your belt. The most common causes of idler "freeze-ups" are grit and dirt entering the bearings and build-up of material underneath the roll. To keep your Rex Idlers rolling, all you have to do is *keep your deck plates clean.* This will prevent material from building up on the rolls. The Rex Triple Labyrinth Grease Seal does the rest. The grease is there only to keep out dirt and grit, not to lubricate. With the special Rex seal design, the grease stays in . . . the dust stays out.

Remember, your idlers are the backbone of your entire belt conveyor. Don't gamble. Insist on Rex and be sure of a trouble-free performance year after year. For all the facts call your nearest Chain Belt Field Sales Engineer or write for Bulletin 51-81.

Chain Belt Company, 4660 W. Greenfield Avenue, Milwaukee 1, Wisconsin.



For over 25 years Rex Idlers have been recognized as leaders in the field of idler design. Now Rex again leads the way with the flexible grease line. Note the accessible, protected location of the fitting. Extension of tubing to far side can easily be done in the field without special tools. Flexible sections hug the inside of the base.

CHAIN BELT REX COMPANY ®

Chain Belt COMPANY OF MILWAUKEE

Atlanta • Baltimore • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Cleveland
Dallas • Denver • Detroit • El Paso • Houston • Indianapolis • Jacksonville
Kansas City • Los Angeles • Louisville • Midland, Texas • Milwaukee • Minneapolis
New York • Philadelphia • Pittsburgh • Portland, Oregon • Springfield, Mass.
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Distributors located in principal cities in the United States and abroad

STOP RUST! with RUST-OLEUM

Protects Tanks, Pipes, Girders, Metal Sash, Fences, Roofs and Buildings, Rail and Marine Facilities

BEAUTIFY AS YOU PROTECT—ALL COLORS, ALUMINUM AND WHITE!

RUST-OLEUM may be applied directly over *rusted surfaces without removing all the rust!* Just remove rust scale and loose particles with wire brush and sharp scrapers... then apply by brush, dip, or spray. Costly sandblasting and chemical pre-cleaning are not usually required. Easy as that to cut your maintenance costs. Specify **RUST-OLEUM** to your painting contractor or architect for *every rustable* metal surface! Prompt delivery from Industrial Distributor stocks in principal cities.

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2534 Oakton Street • Evanston, Illinois

FREE SURVEY: A **RUST-OLEUM** specialist will gladly survey your rust problems. He'll make specific tests and recommendations. No cost or obligation. See Sweets for complete catalog and nearest **RUST-OLEUM** distributor, or write for literature on your company letterhead.

Stopping Rust with **RUST-OLEUM** 769 D. P. Red Primer

CLIP THIS TO YOUR LETTERHEAD
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- ☐ Have a Qualified Representative Call
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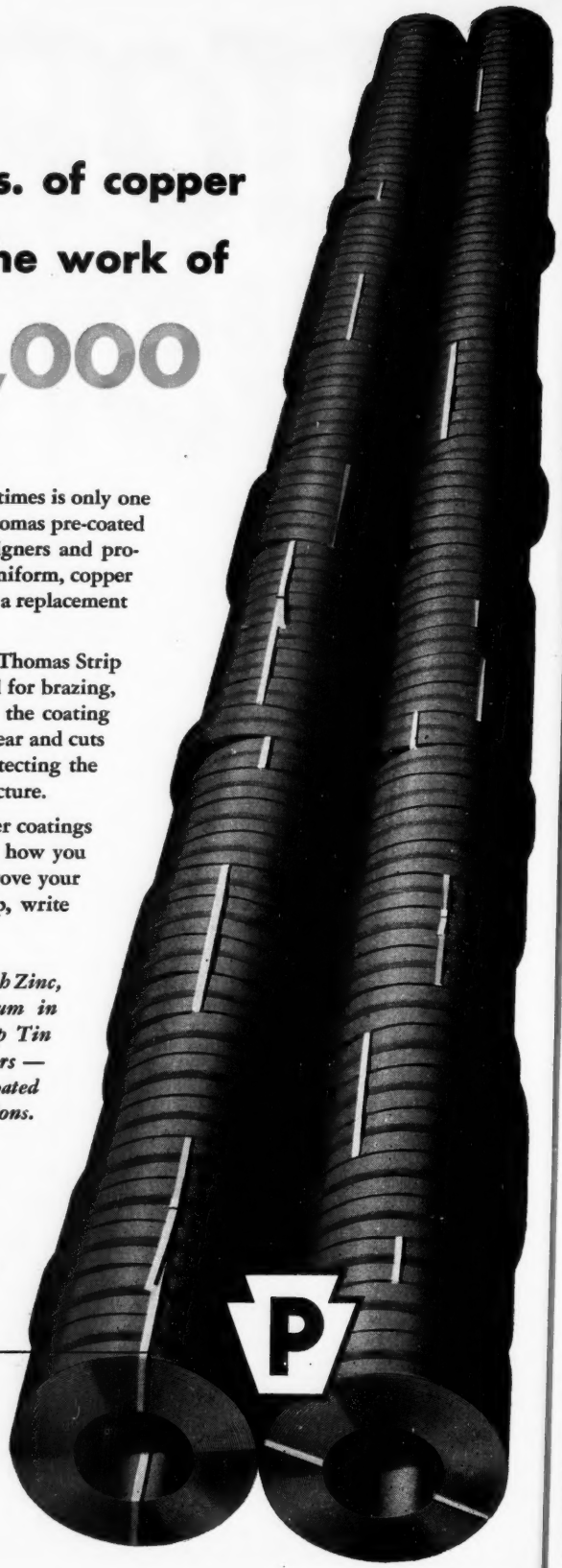
Look for this label — be sure it's genuine RUST-OLEUM

How 40 lbs. of copper does the work of 2,000



Stretching the usefulness of copper as much as 50 times is only one of the ways you can save critical materials with Thomas pre-coated cold-rolled strip steel. In many applications, designers and production engineers find that the tightly adherent, uniform, copper pre-coat on steel serves their purpose adequately as a replacement for the pure metal.

The uniform non-peeling coating of copper on Thomas Strip has many functional advantages and is widely used for brazing, tinning, and soldering operations. In fabrication, the coating acts as a die lubricant, increases die life, reduces wear and cuts retooling costs. It has the added advantage of protecting the base metal from rust during the course of manufacture.

Pre-coated Thomas Strip is also available in other coatings to save critical materials as listed below. To learn how you can help conserve scarce non-ferrous metals—improve your product and speed production with Thomas Strip, write today for information.

Cold-rolled strip steel electrolytically pre-coated with Zinc, Copper, Brass, Nickel, Lead-Alloy and Chromium in Natural, Planished and Buffed Finishes—Hot Dip Tin and Lead Alloy Coated — Lacquer Coated in Colors — Annealed Spring Steel—Alloy Strip Steel—Uncoated Strip Steel. Carefully produced to your specifications.

Thomas Strip

a product of

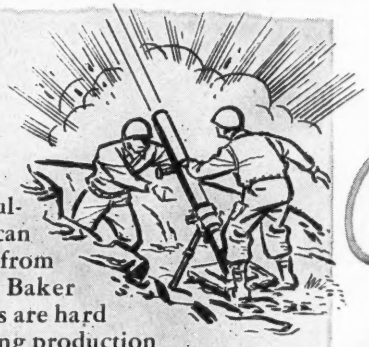
Pittsburgh Steel Company

Thomas Strip Division
Warren, Ohio

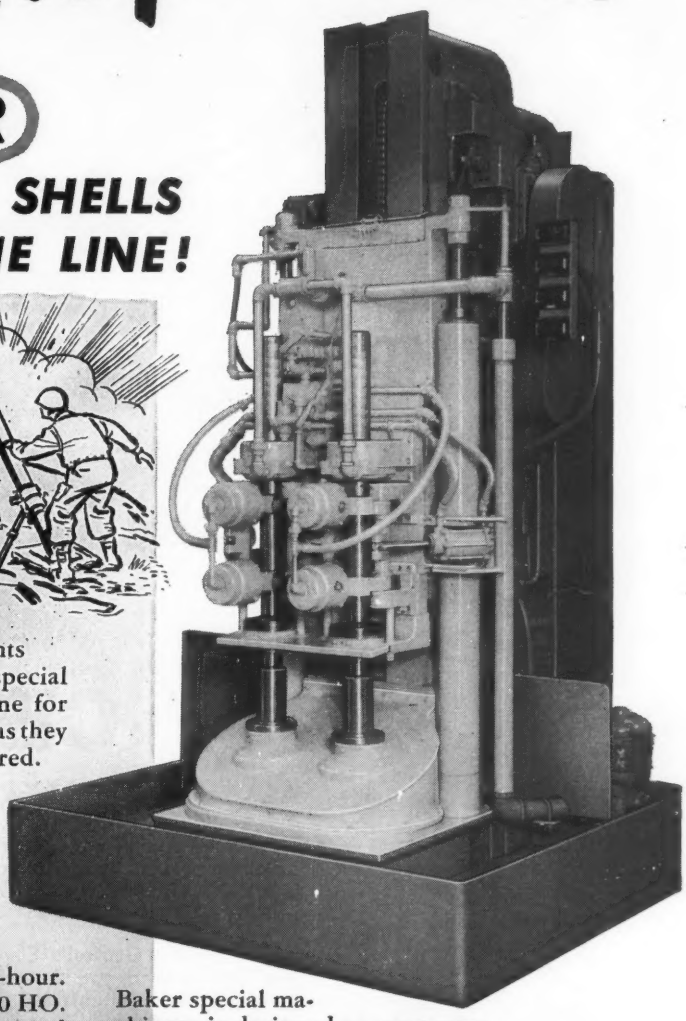
56 Parts per hour...

BAKER

KEEPS MORTAR SHELLS ROLLING OFF THE LINE!

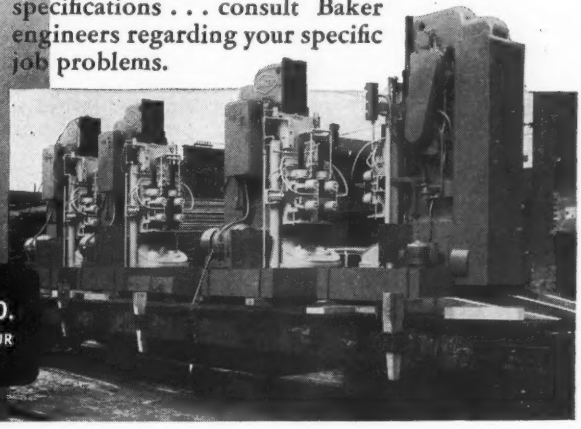


Better machine tools are the bulwark of American defense. Today, from coast-to-coast, Baker special machines are hard at work increasing production figures in the manufacturing plants across the nation... New Baker special machines are rolling off the line for even greater productivity, as fast as they can be designed and manufactured.



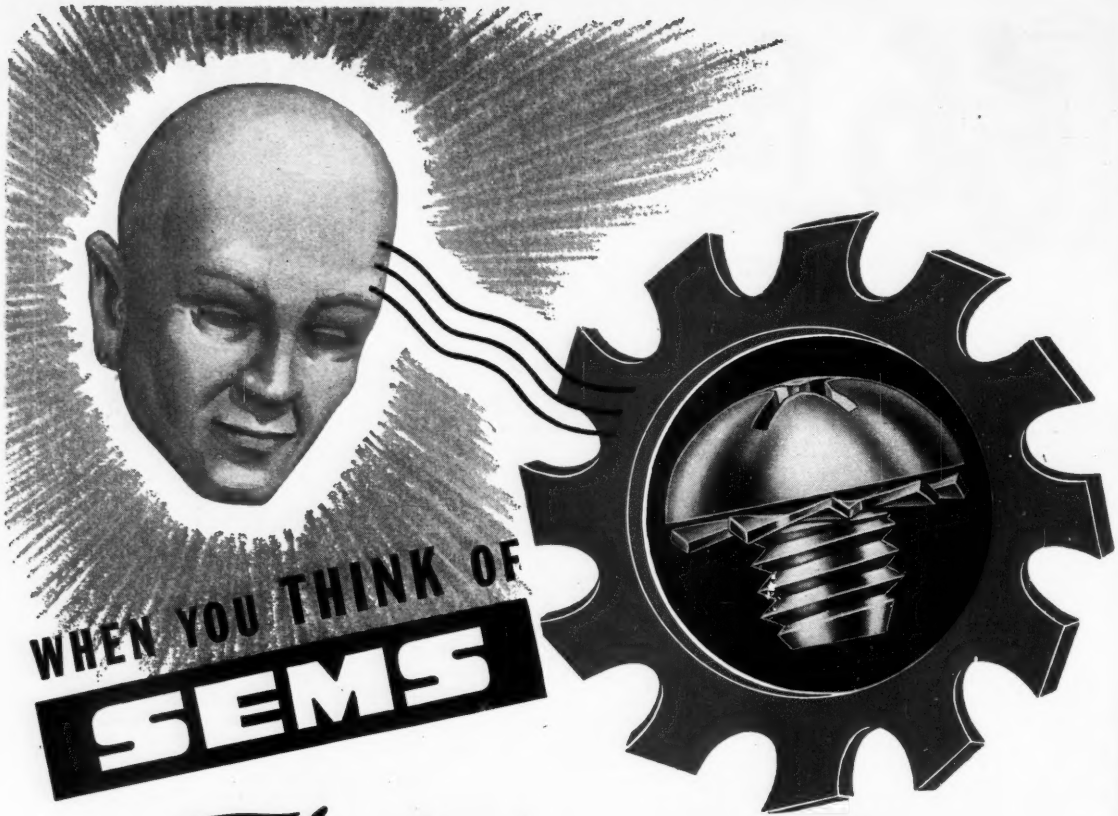
Increased production is attained in boring and counterboring operations on 4.2 inch chemical mortar shells with Baker special machines. Rate of production . . . 56 parts-per-hour. The machine . . . Baker Model 30 HO. Heavy Duty Two Spindle Inverted Type Hydraulic Feed High Speed Boring Machine. The operations... chucking two shells; locating shells over spindles from fixed vee blocks, one each at upper and lower end of each shell; bore 3.73" diameter hole to 15 inch depth of cut; counterbore 3.74" diameter hole to 7/16 inch depth of cut.

Baker special machinery is designed to meet your specifications . . . consult Baker engineers regarding your specific job problems.



BAKER BROTHERS Inc., Toledo, O.

DRILLING, BORING, TAPPING, KEYSEATING AND CONTOUR GRINDING MACHINES



Think of CENTRAL

ALL HEADS STYLES • ALL METALS

RESEARCH—Aimed at superior products, Central's years of exhaustive research on all types of pre-assembled lockwasher applications make possible the broadest use of the Sems method of fastening.

KNOW-HOW—Central's Sems come to you with proven *pre-determined* specifications for the correct ranges of spring action, recommended types of washers (external—internal—countersunk—large dome—ring diameter—helical—flat washers—Neoprene or fibre discs).

QUALITY—Years of experience in fastener design and tool control, coupled with high speed precision production equipment, insures top quality. Central's Sems with Phillips Recessed, standard slotted, clutch heads obtainable with every type of pre-assembled washer, will reduce your costs.

"You Can Depend on Central"

CENTRAL SCREW COMPANY

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Advertisement

ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

High-Chromium, High-Carbon Iron

. . . the Iron That Hardens as it Wears

In many applications involving extreme abrasion, ordinary work-hardening alloys are not suitable. This is because most of these alloys require a definite pounding action for a martensite transformation, and the scouring action of an abrasive is not sufficient for development of high wear resistance. For this reason, high-chromium, high-carbon irons were developed — irons that wear-harden.

Chromium Content of Irons Ranges from 24 to 30 Per Cent

These irons are made in the electric furnace and have the following composition range:

Chromium	26 to 28 per cent
Carbon	2.60 to 2.80 per cent
Manganese	0.50 to 1.25 per cent
Silicon	0.25 to 0.75 per cent
Sulphur	max. 0.05 per cent
Phosphorus	max. 0.05 per cent
Nickel	minimum
Iron	balance

Irons of this composition are readily castable by steel casting techniques.

Development of Greater Wear Resistance by Heat Treatment

Structurally, these irons consist of primary iron-chromium carbides in a matrix of iron-chromium solid solution and secondary iron-chromium carbides. They are hard in the as-cast condition (500 to 550 Brinell), but when they are given an austenitization heat-treatment they develop much higher hardness (about 600 Brinell), and also have greatly improved wear resistance. Austenitization consists of heating these irons to a temperature of about 2012 deg. F. for an hour, then allowing them to cool in air. This heat-treatment promotes the formation of very unstable austenite—austenite that will transform to a harder martensitic end-product even under rubbing or mild impingement action. Austenitization has been found to be far more effective in increasing wear resistance than the promotion of unstable austenite by the addition of ferrite-forming alloying elements.

High-chromium, high-carbon irons can also be annealed to sufficiently low-hardness values for grinding or simple machining. Hardnesses as low as 350 to 450 Brinell can be obtained by heating the castings to temperatures of 1400 to 1450 deg. F. for 12 to 24 hours, then allowing them to cool in air.

Irons Have Wear Resistance Many Times That of Other Alloys

Austenitized high-chromium irons have been known to last as much as 21 times longer than other wear-resistant alloys in applications involving extreme frictional abrasion. These applications include sand-blast nozzles and liners, pantograph contact shoes, grinding disks, pulleys, chute-liner plates, dredge-pump liners, and rollers for crushing various hard materials.

In a recent test, high-chromium iron was compared to special wear-resistant steel castings as the material for hammers in a machine that was used to crush abrasive material. The chrome-iron hammers were found to have almost 7 times the wear resistance of the steel castings.

When thoroughly backed up with zinc, the iron also has enough shock resistance to be used effectively as crushing hammers and jaw plates for many severe rock-handling jobs.

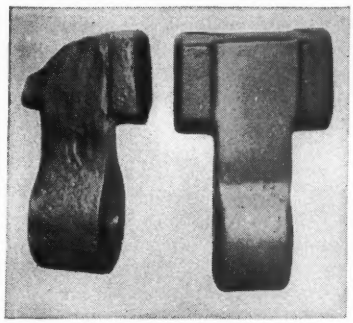


Fig. 1. After crushing the same amount of abrasive material in a hammer mill, the badly worn steel casting (left) had a weight loss of 37 per cent while the high-chromium iron casting (right) lost only 5.5 per cent.

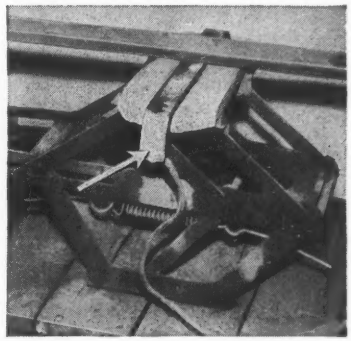


Fig. 2. This chrome-iron pantograph shoe had a service life of about 10 years. A tool steel that was used in similar service wore out in about 3 or 4 months; copper lasted about 24 hours.

Metallurgical Service Available

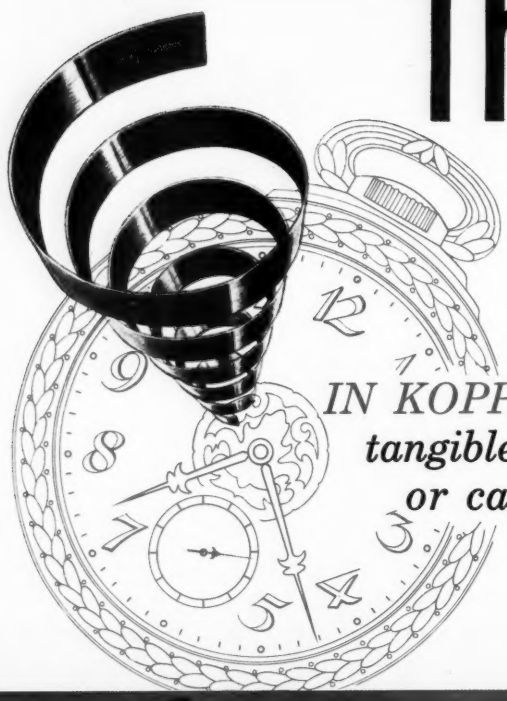
For years, ELECTROMET high-carbon ferrochrome has been used to make chromium additions to abrasion-resistant high-chromium irons. If you should have any questions about either the production or use of these irons, write to the nearest ELECTROMET office. Our metallurgists will be glad to give many valuable suggestions and recommendations on how to make or use this iron most effectively.

Write for a free copy of the ELECTROMET publication, "Abrasion-Resistant High-Chromium Iron." This booklet is a collection of some of the best available information on how to make and to use abrasion-resistant iron castings most efficiently.

The term "Electromet" is a registered trademark of Union Carbide and Carbon Corporation.

The part you c

is the thing t



IN KOPPERS ENGINEERING . . . the intangible element, the thing you can't see or can't measure, is one of the most important. We call it sureness.

These 65 new Koppers-Becker Coke Ovens carbonize approximately 1,400 net tons of coal per day at a coking rate of 1.08 inches per hour.

u cannot see...

g that makes it tick!

SURENESS that guarantees a thorough, dependable job.

SURENESS that provides the most practical solution to the problem.

SURENESS that reduces cost, saves time.

SURENESS that comes *only* with experience.

And look at Koppers experience:

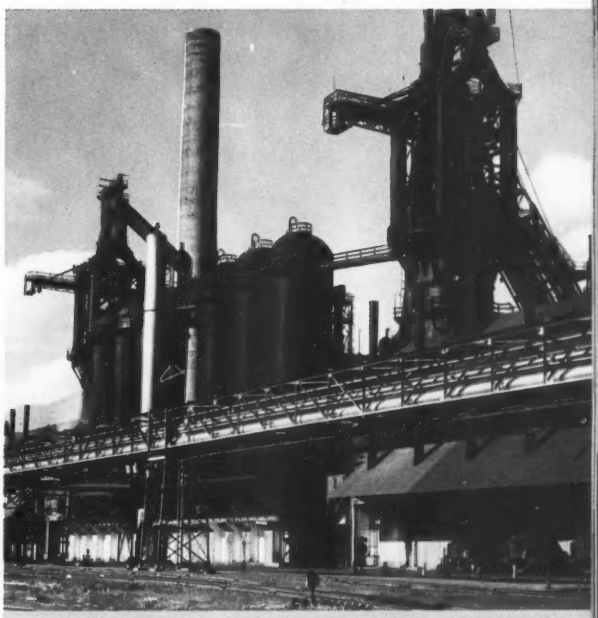
Coke Ovens—Coal-Handling Systems—Power Plants—Blast Furnaces and Stoves—Mills—Open-Hearth Furnaces—Coal Chemicals Plants.

In the construction of such facilities all over the world, Koppers talented engineers developed many modern techniques and new answers to old problems that are now accepted as standards throughout the iron and steel industry.

This pioneering has given industry such equipment and techniques as the famous Koppers-Becker underjet oven, Freyn-designed blast furnace, open-hearth and sintering-plant equipment. And it has given Koppers engineers a SURENESS in their approach to engineering and construction problems that counts in final results.

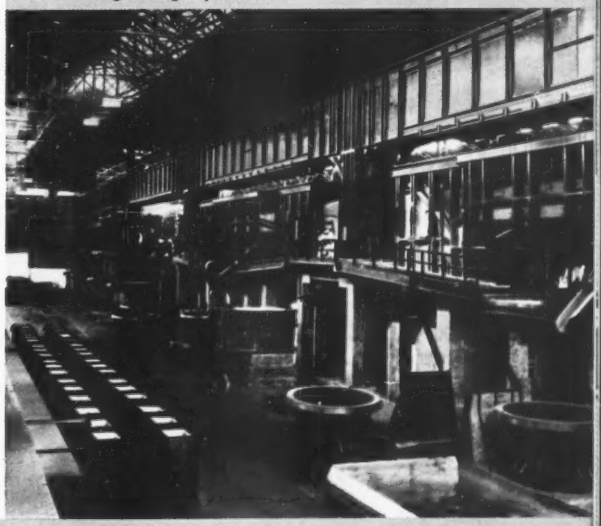
For any kind of metallurgical construction
YOU CAN COUNT ON KOPPERS

KOPPERS *Engineering and Construction Division*



▲ Typical Freyn-designed and constructed blast furnaces and stoves.

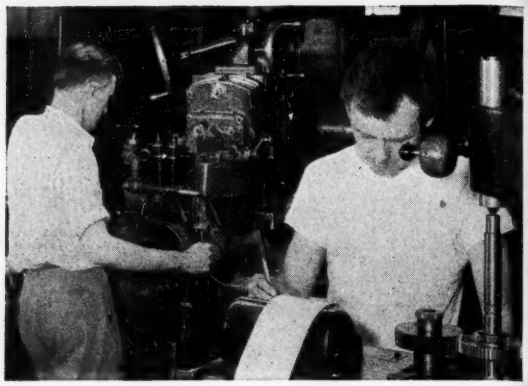
▼ Open-hearth furnaces designed and constructed by the Freyn Engineering Department.



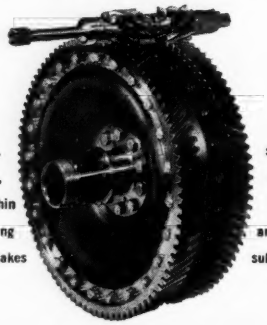
PUT YOUR SHOULDER TO THE WHEEL
SEND IN SCRAP TO MAKE MORE STEEL!

KOPPERS COMPANY, INC., PITTSBURGH 19, PA.

YOUNG MEN OF VISION



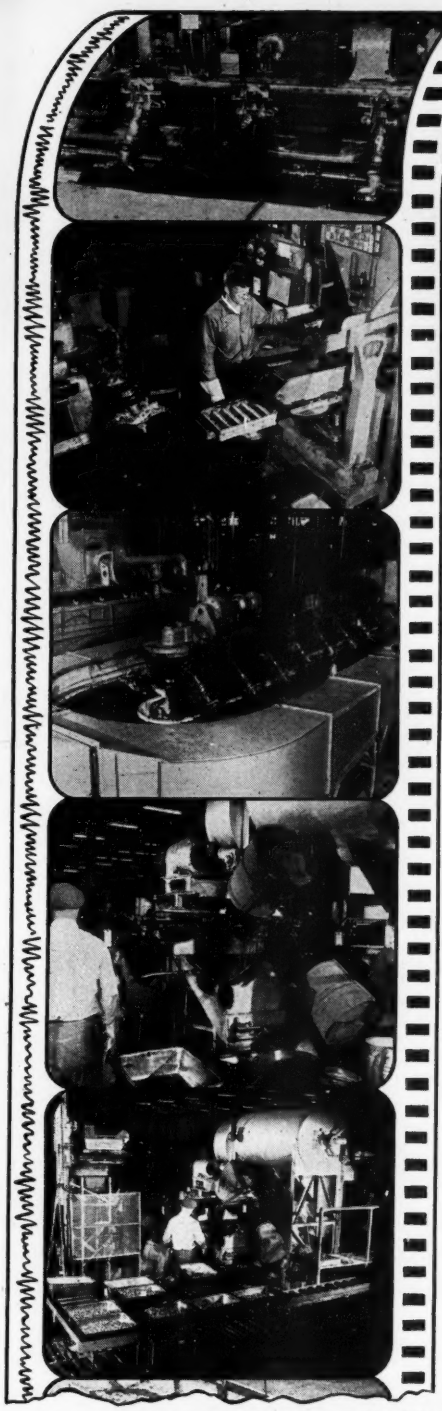
Their business is precision! At Indiana Gear, success or failure is based on vision . . . today's gear problems were solved yesterday and tomorrow's "tough cogs" are on the boards today. It's a hard way to go, but they like it . . . because they fought their way to the top of a highly competitive business with master craftsmen, fine equipment, skilled sub-contractors and "young men of vision."



The thin steel ring gears, shown in this helicopter reduction transmission set, are over 12" in diameter and are maintained round and true within .001" full indicator reading through carburizing, hardening and tempering. This absolute metallurgical control makes subsequent tooth grinding unnecessary.

INDIANA GEAR

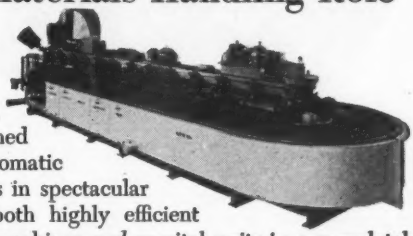
INDIANA GEAR WORKS · INDIANAPOLIS 7, INDIANA



Frederic B. Stevens, INC.
presents

AN INDUSTRIAL ALBUM

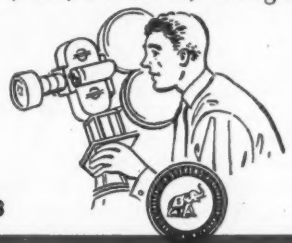
Starring
The STEVENS MODEL "C"
Automatic Barrel Plating Machine In A New Materials Handling Role



"An Industrial Album," the new Stevens motion picture, shows world-famed Stevens Model "C" Automatic Barrel Plating Machines in spectacular double roles—that of both highly efficient plating and processing machines *and* as vital units in a completely automatic materials handling system. Never before has the entire story been shown on a motion picture screen!

See this dramatic presentation of what Stevens Full Automatic Barrel Plating and Processing Machines can do in actual production. Learn the full story of the many and varied operations this unit does while reducing costs and upping production. It's something you and others in your company cannot afford to miss. Make arrangements now to have a showing of "An Industrial Album" for your plant engineers, your trade association, club, school or professional group. Just call your nearest Stevens sales office or write direct to Frederic B. Stevens, Inc., Detroit 16, Michigan.

A TRULY GREAT INDUSTRIAL MOTION PICTURE!



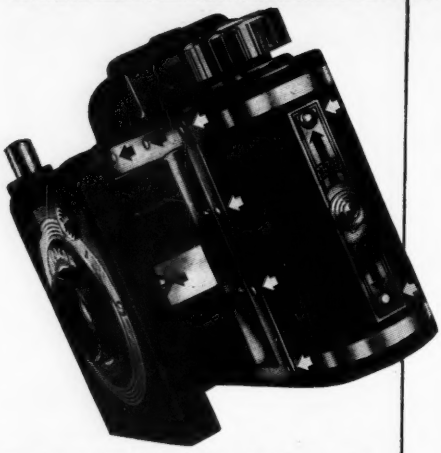
METAL FINISHING EQUIPMENT AND SUPPLIES SINCE 1883

FREDERIC B. STEVENS INCORPORATED

DETROIT 16, MICHIGAN

This man can show you . . .

How to eliminate needless operations that slow up assembly hands



Because no tapping or inserts in plastic parts slowed production of this camera, assembly costs were greatly reduced. Sixteen P-K Type U Drive Screws were pressed into blind, untapped holes to assemble sheet metal and Bakelite parts. Two P-K Type Z Screws fasten the periscope extension box.

Ask a P-K Assembly Engineer to help you "question every fastening". He'll show you where tapping for machine screws, inserts in plastics, and awkward bolting or riveting are wasting time, boosting costs.

His experience is based on more than a million P-K applications. He can quickly determine which Self-tapping Screw, from Parker-Kalon's complete line of *standard* types, will help you make better, faster, stronger assemblies, at lower cost.

Today, more than ever, the P-K Assembly Engineer is a good man to have on your production team, helping you boost output and beat the squeeze on profits. He'll call at your request. Parker-Kalon Corporation, 200 Varick St., New York 14.

Type U Hardened Drive Screw, one of five standard types of P-K Screws. For permanent fastenings in castings, heavy gauge sheet metal, and plastics.

Your INDUSTRIAL SUPPLY DISTRIBUTOR . . . *your local source for P-K Screws—works side by side with the P-K Assembly Engineer. Their combined efforts are solving many difficult problems of planning and procurement. Let them help you.*

P-K
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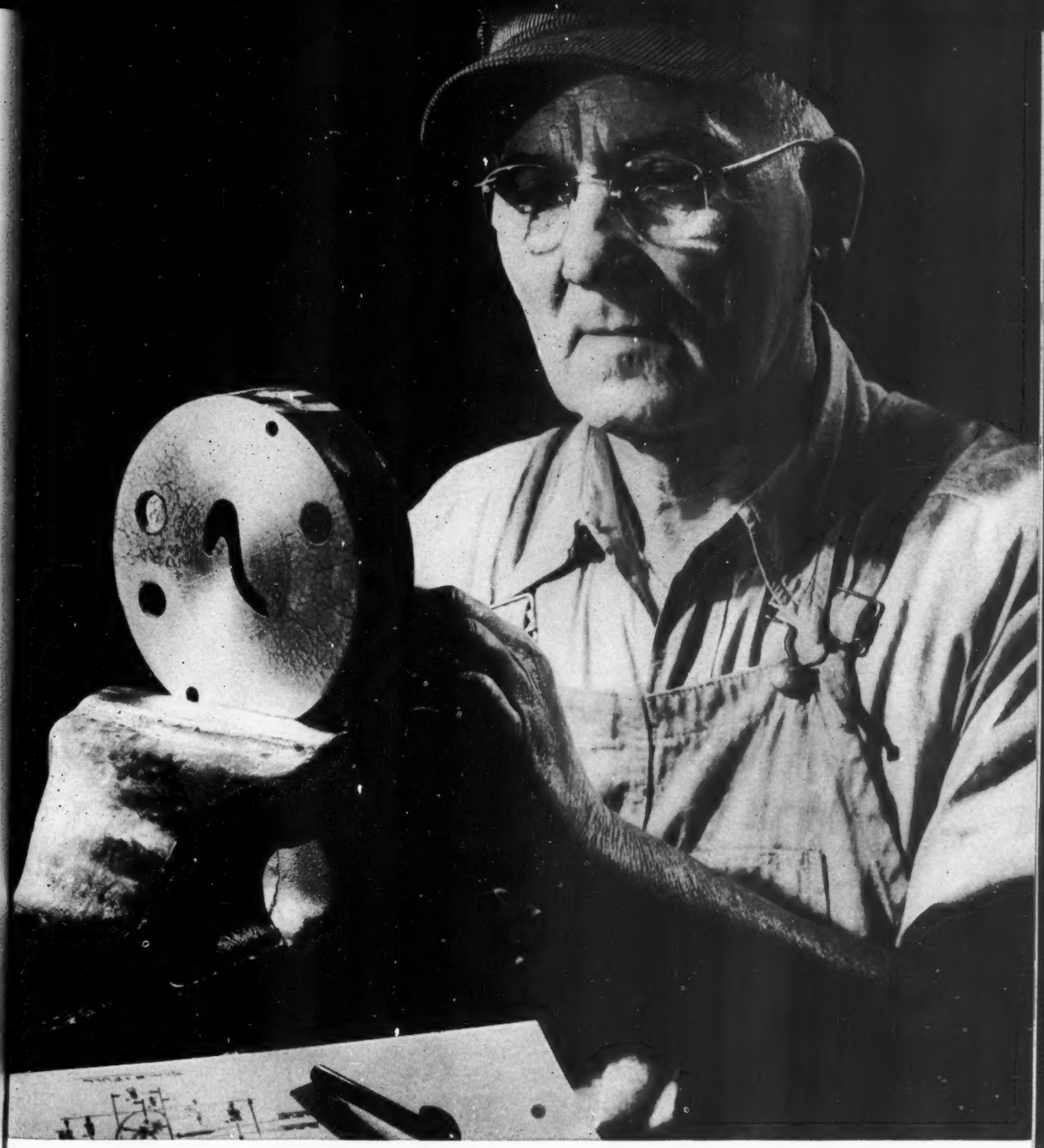
PARKER-KALON®

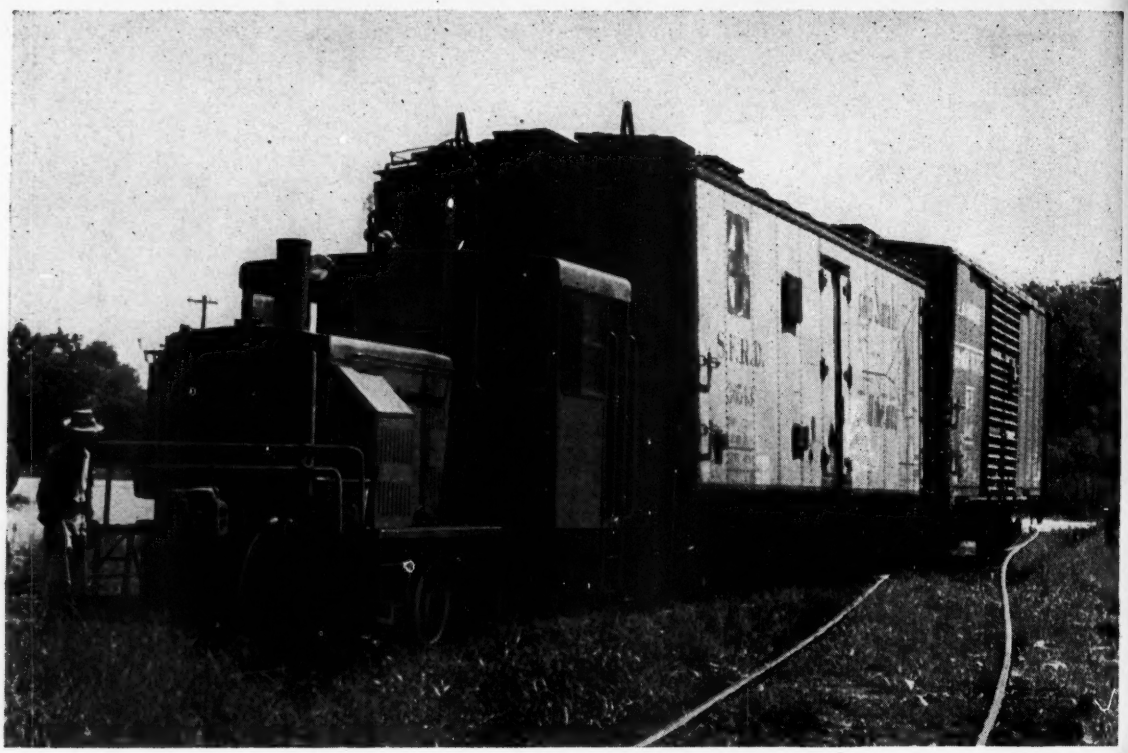
The Original **SELF-TAPPING SCREWS**

FOR EVERY METAL AND PLASTIC ASSEMBLY



Industrial Jeweler at work... one of Bristol's veteran toolmakers focuses all his experience on the perfection of an extrusion die for a special shape. Workers in precious metals could not exercise more care. Yes, of course it takes time . . . just as it takes time to train a good man to this special competence. But it's worth every second of it . . . for this is what gives "Bristol-Fashion" its special meaning . . . the best you can get in Brass sheet, rod, wire or extruded shapes. The Bristol Brass Corporation, since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

"Bristol-Fashion" means Brass at its Best



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Wherever economical switching is called for—in-plant or out-of-plant, heavy or light work, narrow gauge or standard—Plymouth Locomotives are earning a leading reputation as the Nation's most efficient switchers!

"Our 20-ton Plymouth handles 10 empty or five loaded freight cars," reports the St. Louis and Troy Railroad Company. "During its four years of service averaging 20 work hours per week, Plymouth has ably demonstrated its economy of operation. This powerful locomotive consumes only 15 or 20 gallons of fuel a day, and very little time has been lost for maintenance.

"Not only are we satisfied with Plymouth performance, but we have effected definite savings over former methods of switching!"

Gasoline, Diesel, and Diesel-electric Plymouths are built in 3-ton and 70-ton sizes for every switching need. Find out how Plymouth can speed your production, cut your costs. Send now for Plymouth catalog. PLYMOUTH LOCOMOTIVE WORKS, Division of The Fate-Root-Heath Company, Dept. A-1, Plymouth, Ohio.

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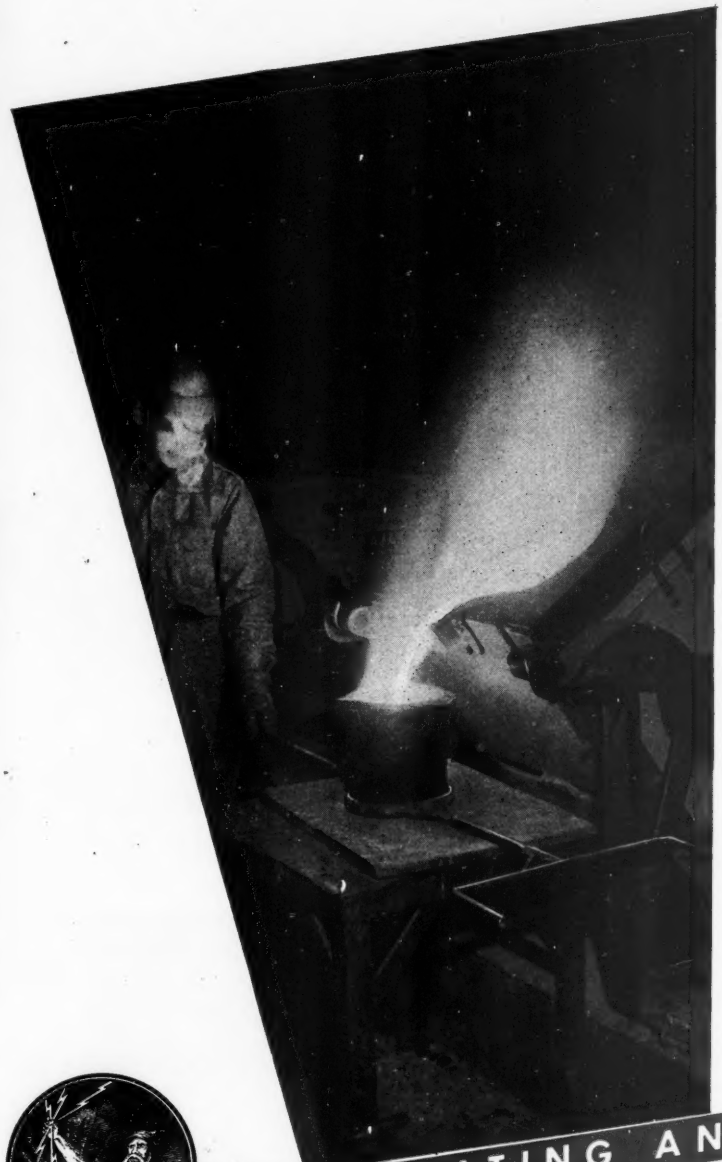
ALSO MANUFACTURERS F-R-H CERAMIC MACHINERY

Save critical alloys

WITH AJAX-NORTHRUP INDUCTION MELTING



High speed melting enables Ajax-Northrup high-frequency furnaces to recover *all* of the nickel in the charge, 99% of the chromium, 95% of the molybdenum . . . consistently high percentages of every alloying element.

The difference between these figures and the performance of ordinary furnaces represents *savings* . . . both of money, and of critically hard-to-get alloys.

For instance, a 2% chromium saving in one Ajax-Northrup equipped foundry saves ten tons of ferrochrome a month, or $60,000 a year. (Melting capacity 1,000,000 lbs. a month—63% ferrochrome @ 25¢/lb.)

$60,000 a year pays for the furnaces in short order—and the chromium saved is enough for an extra 70,000 pounds of 18 and 8 stainless steel a month.

The figures are slightly different for other critical alloying elements. But the arithmetic's the same—the total savings frequently just as impressive.

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...and wait for delivery

...wait—and watch production stay at zero

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...and *pay* your employee while he goes for the belt

...*pay* through loss of production

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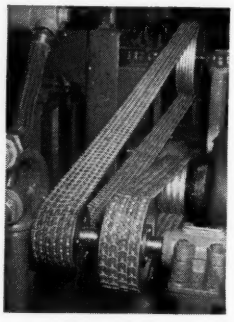

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V-BELT

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Made in all widths in three types: regular, oil-proof, static conducting. Also double V in 0, A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. VEELOS is known as VEELINK outside the United States.

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You don't have to be endowed with a green thumb to make your garden grow. Having the right equipment is a lot more helpful—and everybody can get that.

The best gardening implements are plentiful and low priced—because they're made of steel. Steel tools last longer because steel lasts longer. They keep a keener cutting edge because steel is harder and tougher. They cost less because steel is America's great bargain metal.

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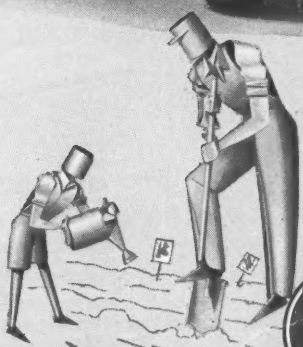

Metal sculpture, executed in Weirzin—electrolytic zinc-coated steel that resists heat, moisture, rust—demonstrates the exceptional workability of this easily fabricated metal.

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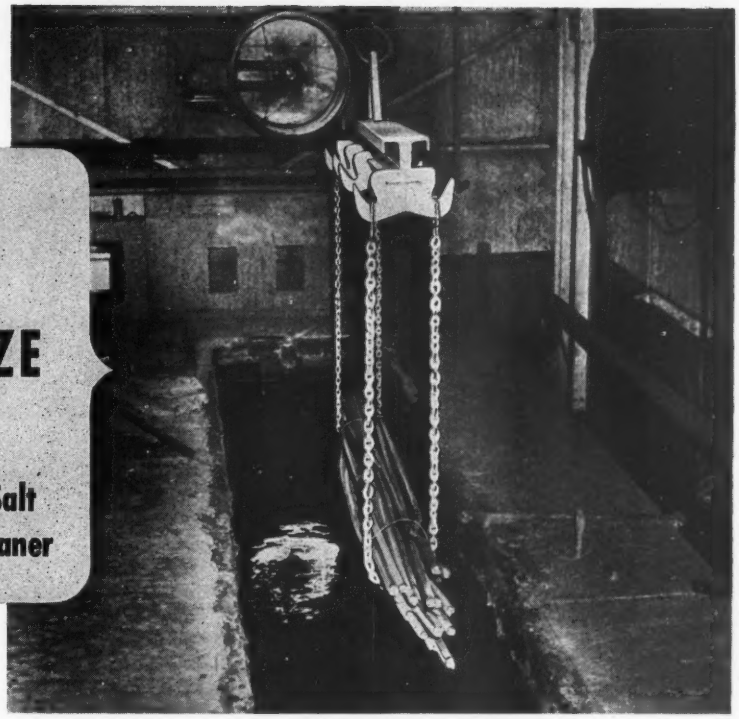

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The Hooker Process for descaling stainless and alloy steels and for cleaning ferrous metal of any type is the quickest, simplest available.

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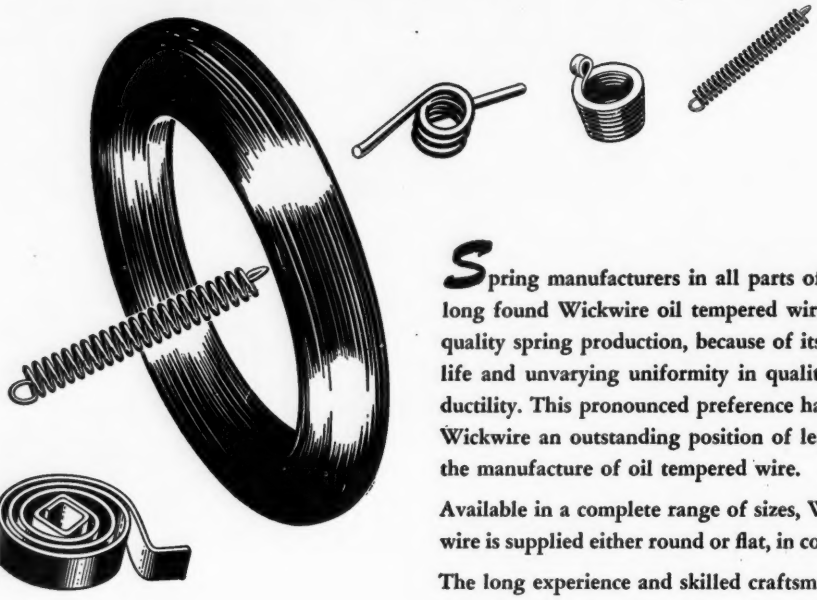
by WICKWIRE

for top quality spring production



Spring manufacturers in all parts of the country have long found Wickwire oil tempered wire the answer to top quality spring production, because of its high fatigue life and unvarying uniformity in quality, temper and ductility. This pronounced preference has won for Wickwire an outstanding position of leadership in the manufacture of oil tempered wire.

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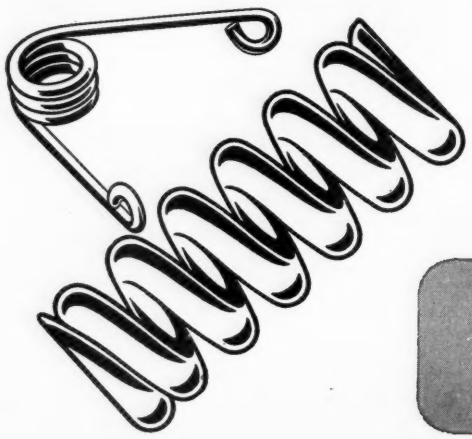

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THE COLORADO FUEL AND IRON CORPORATION

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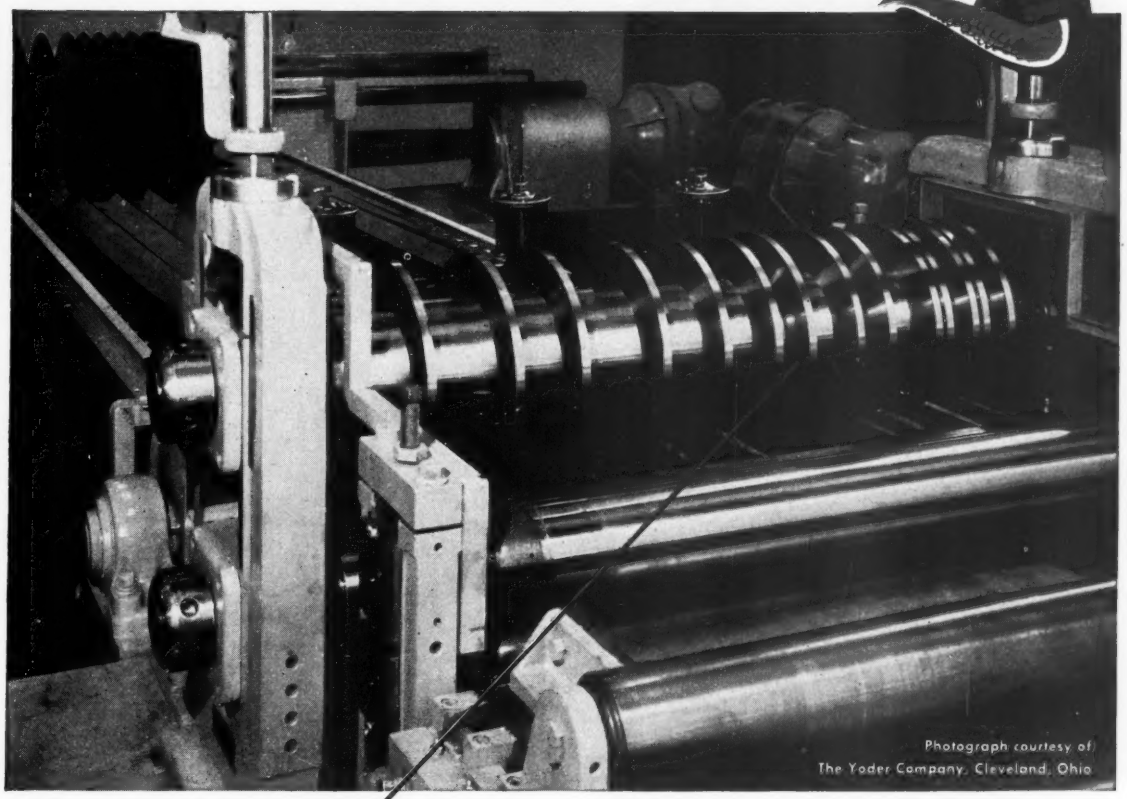
it's OK...let'er go!



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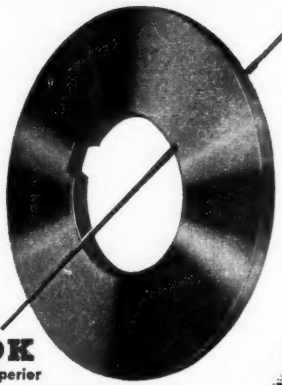

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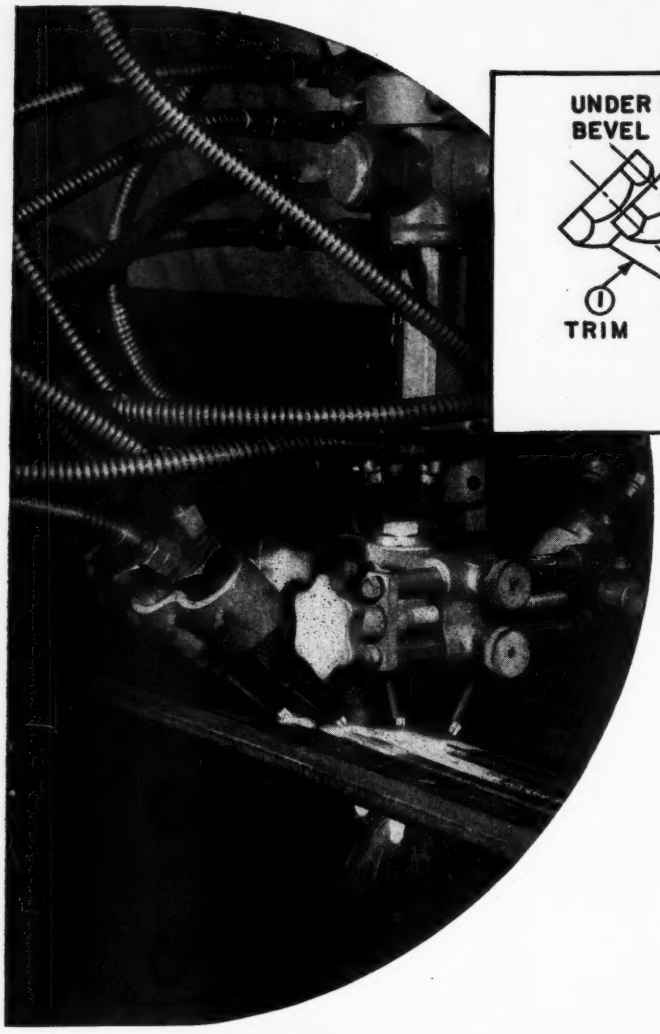

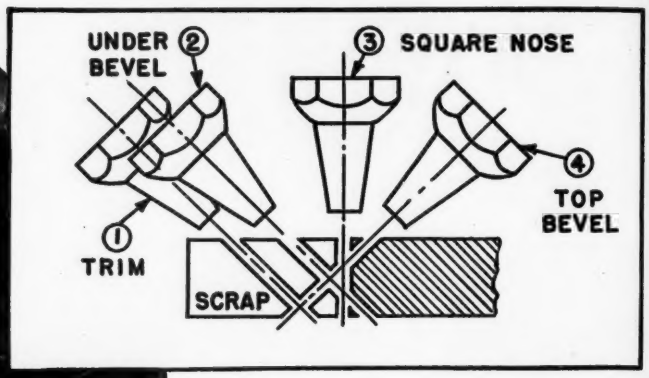

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Swift-moving oxy-acetylene flames prepare steel plate edges for welding in a fraction of the time required by mechanical methods. Multiple nozzles, cutting in different planes simultaneously, slash with ease through any commercial thickness. *Just one pass to "finish" dimensions* turns out a square edge, single bevel, single bevel and nose, double bevel, double bevel and nose, or J-groove and nose. Edge preparation costs tumble; production booms.

LINDE'S oxygen-cutting methods are simple and flexible. They are economical and easy to use. They cut plates so smoothly and accurately that *no machining is necessary*—edges are ready to weld "as cut". Rigid fit-up and contour specifications are easily met. Yet, initial investment in OXWELD flame-cutting equipment is only a fraction of that for comparable machine tools. Upkeep over the years is extremely low.

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On Erie Hammers all stressed parts, frame, anvil, upper works are steel.

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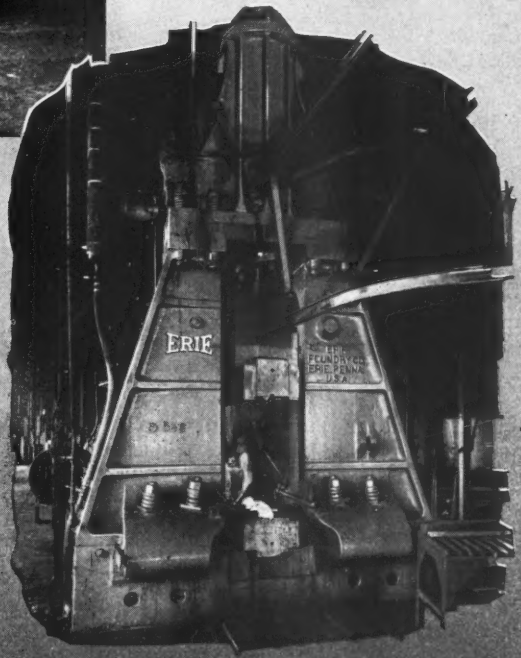

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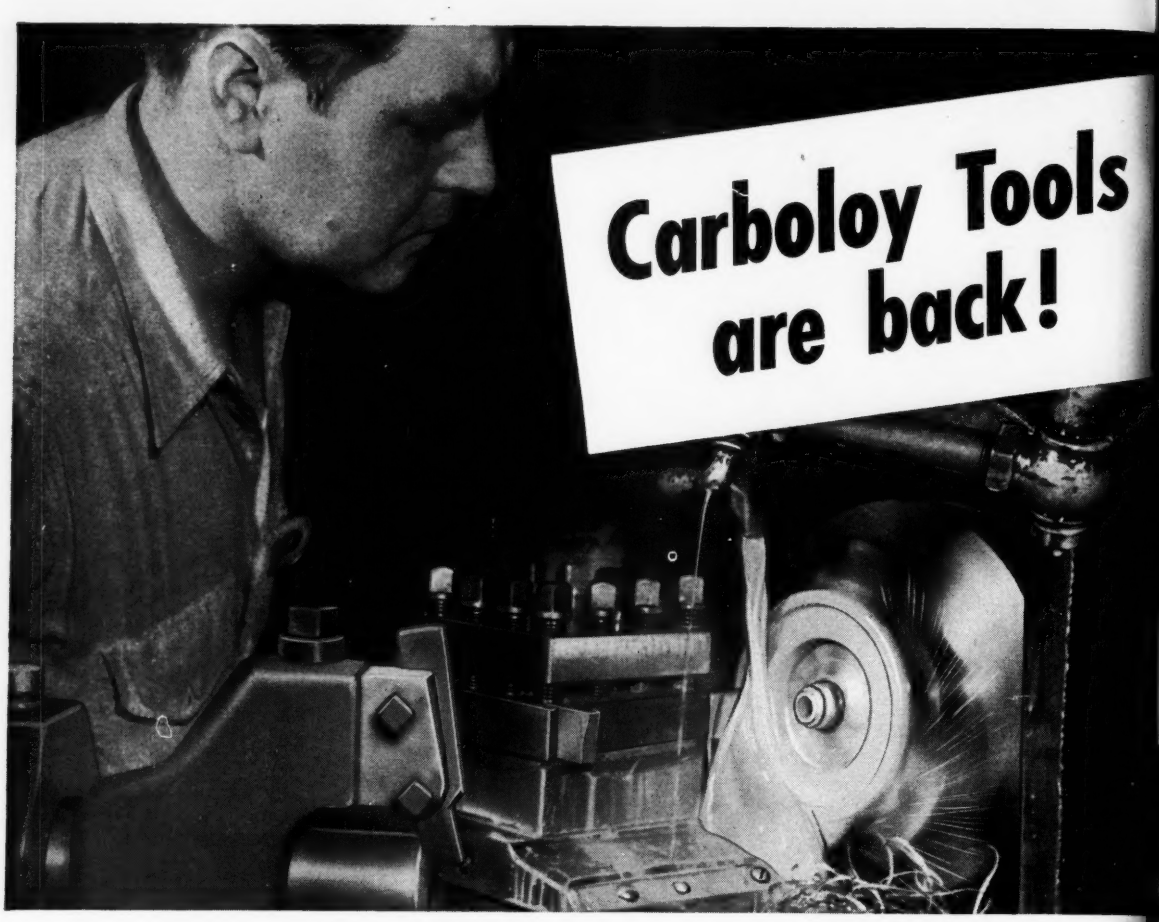

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ONCE again production lines are rolling full blast at Carboloy plants. And once again you can start to get *all* the fast-cutting, cost-cutting benefits that Standard Carboloy Tools and Blanks are famous for:

Greater output per tool per hour. Longer tool life. Less down-time and maintenance. Lower costs all down the line from tough, wear-resistant cemented carbides that have no equal in the field.

There's no need to accept substitutes any longer, nor to settle for ordinary carbide performance. With Carboloy "Standards" coming back on distributors' shelves, you can again start to get sensational, proved Carboloy results that add up to *faster, better, more profitable* production in your plant.

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See your Authorized Carboloy Distributor for the 11 great styles of inventory-slashing Standard Tools that can do 80% of your single-point machining jobs. And start stocking up again on the handy Standard Blanks for the "special" jobs, too! As before, blanks are available in hundreds of sizes and shapes . . . easy to braze and grind in your own toolroom to your exact needs for emergency use.

and services!

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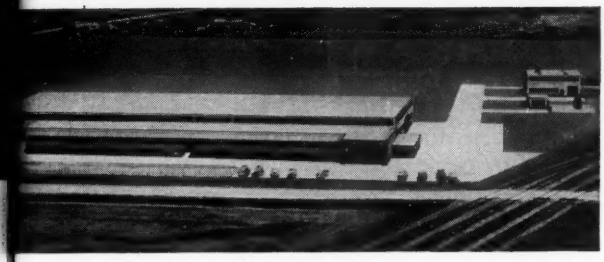
See your Authorized Carboloy Distributor or call Carboloy direct.

THE LARGEST, most modern cemented carbide plant in the world is back again on full production . . . starting to turn out controlled, high-quality Carboloy Cemented Carbides you can depend upon for uniformity, matchless performance. The production techniques practiced here at the Carboloy Detroit plant mean better carbide tools at lower cost, too.



AT EDMORE, Michigan, the Carboloy organization has just opened a fine, new plant. It, too, is swinging into production and rushing initial stocks of Standard Carboloy Tools to distributors' shelves for you. Ask for them. Accept no substitutes.

FREE—4 helpful, informative Carboloy items: the Tool Catalog GT-250; CCC Plan Book; the Carboloy Tool Manual; complete kit of carbide data on shell machining (for shell contractors only). They're your guides to more efficient production, so send coupon for them today.

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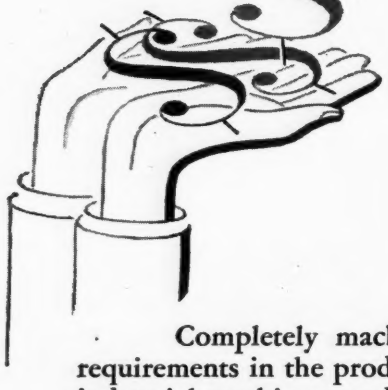

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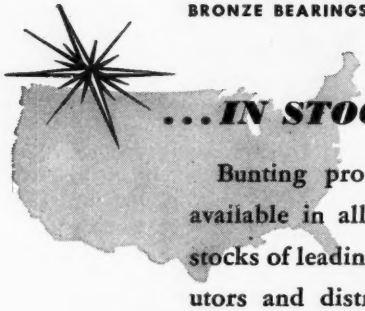

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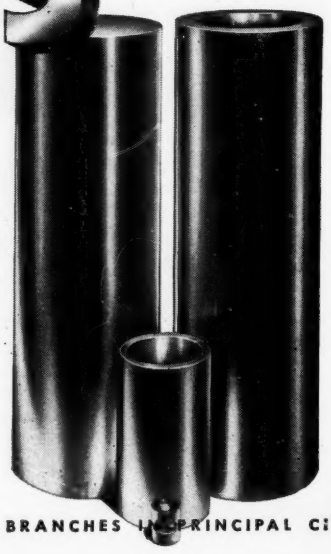

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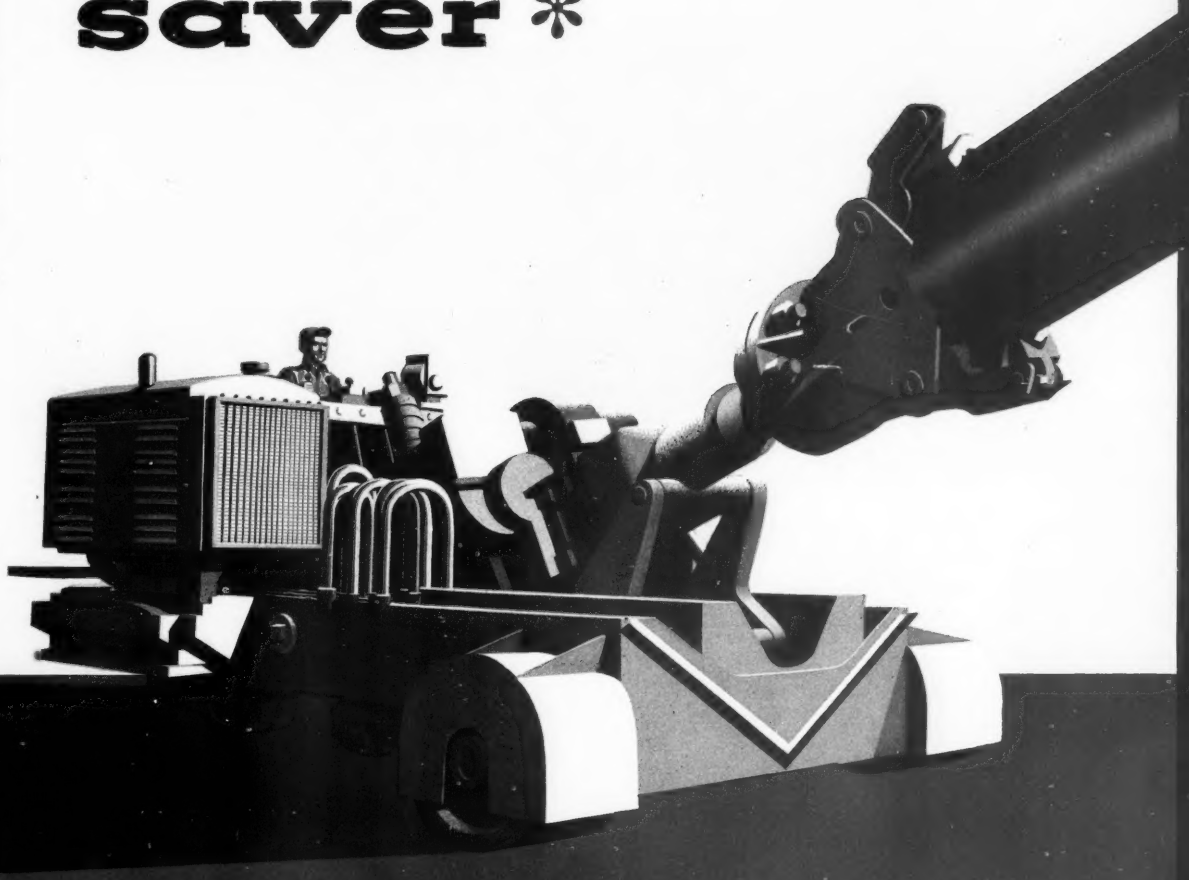

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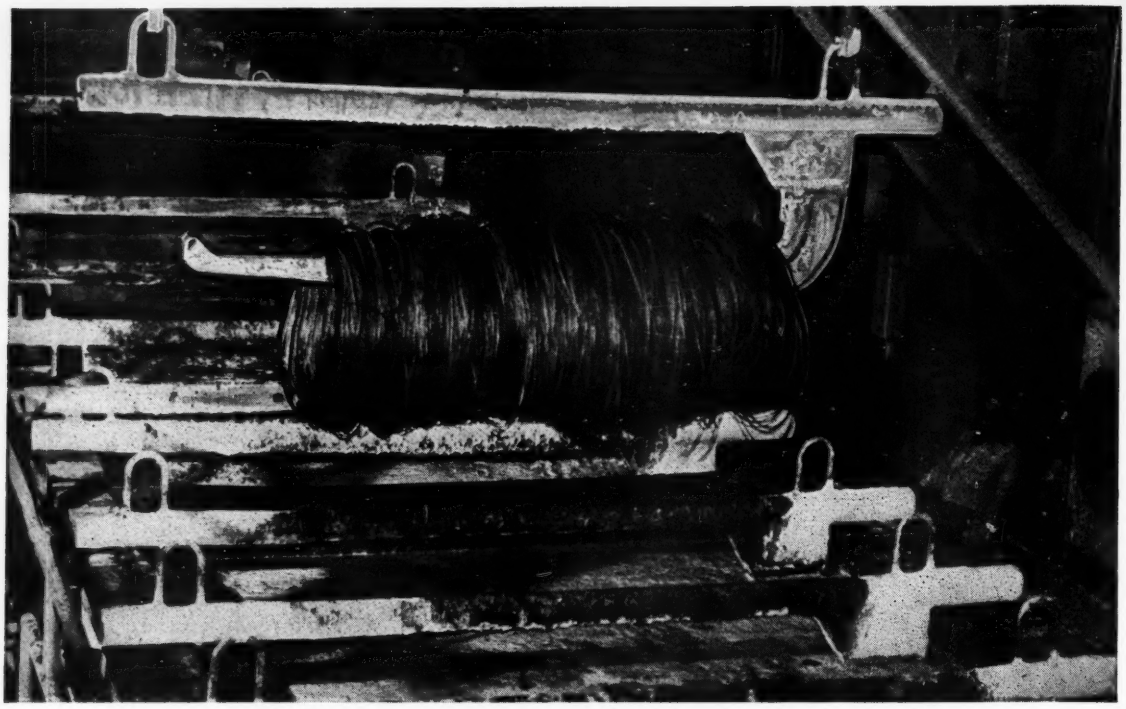
BROSIUS DIVISION, PITTSBURGH 15, PA.

SALEM ENGINEERING DIVISION, SALEM, OHIO



33⅓% LONGER LIFE and still going strong

...Monel pickling hooks for trouble-free operations

The pickling hooks previously used at Jones and Laughlin's Alaquippa Works had been failing after an average of three years in service.

Naturally, this added to the cost of operation. So the plant men decided to search for a material that would remedy the situation.

They tried several metals in both cast and fabricated form. But all of them failed in pickling coiled steel wire in an 8% solution of sulphuric acid at a temperature of 160°F.

Then they tried wrought Monel® hooks and found the solution to their problem. It was over four years ago that they installed 37 Monel hooks fabricated by Youngstown Welding & Engineering Co. And at a recent inspection not one showed any signs of corrosion — although the double thickness iron pipe to which the hooks were welded had been reduced ½" in diameter by the fumes.

The plant men discovered a second advantage in using Monel too —

The cast material previously used sometimes cracked or broke off when a hook accidentally caught on a rack — Monel merely bent and could be straightened and put back in service.

Monel equipment can help you increase the efficiency of your own pickling room, too. Monel crates, racks, hooks, and accessories are used by many of the nation's leading plants to give increased payloads and longer service life.

Monel, like other Inco Nickel products, is on extended delivery. That's because so much is needed for defense. Therefore, it will pay you to anticipate your needs and order well in advance —be sure to include your NPA rating and end-use information. And remember, our Technical Service Department is always glad to help you with your material problems. Why not write today, and ask for your free copy of "5-way savings... in Pickling."

THE INTERNATIONAL NICKEL COMPANY, INC., *67 Wall Street, New York 5, N. Y.*

MONEL... for minimum maintenance

INCO TRADE MARK

The Metalworking Outlook

April 7, 1952

Labor Bores In

Labor, with the help of government, is eroding away management's freedom to manage. That, even more than costs, is worrying many industrialists, and it's highlighted in the steel case with labor's demand for such things as the right of union approval of outside contracting in plant maintenance and repair jobs. Management's freedom to manage is also impaired from another angle—profit erosion. Inland Steel Co. says it's already earning $8 a ton less than in 1950. When management must operate on the narrow ledge between profit and loss, as steel may have to do, it can't operate as freely and as well. Henry J. Kaiser makes light of that angle. Kaiser Steel Corp. signed with the union last week pretty much on the basis of WSB recommendations. Detroit Steel Co. agreed to similar terms. Alan Wood Steel Co. has O.K.'d an interim contract. Negotiations with major companies collapsed last Thursday when the union rejected a company offer of 16 cents.

With a Clear Conscience

Retiring Defense Mobilizer Charles E. Wilson could quit with a clear conscience. He resigned at a time when deliveries of planes, tanks and other hard goods to the Armed Forces, plus military construction, totaled nearly $7 billion in the first quarter. That's more than two-thirds of the goal of $10 billion quarterly, set for rearmament outlays by the end of 1952.

Coming: More Investigations

Watch for a new rash of Congressional investigations into rearmament now that Mr. Wilson is gone. His strong support and championship of industry's role in rearmament will be missed. When the smoke clears, this score card will emerge: Hard goods deliveries to the Navy have been good, to the Army fair, to the Air Force less than fair. But testimony will show that the last showing is caused primarily by the Air Force's reluctance to freeze designs and permit more mass production.

A Little Late

Sen. Blair Moody and his Mobilization & Procurement Subcommittee are looking into conditions in the machine tool business—but a little late. Machine tools once were a serious bottleneck in defense production, but the problem is being rapidly relieved. February machine tool shipments exceeded $81 billion, against less than $4 billion in June, 1950 (p. 89). Tool builders such as Warner & Swasey Co. are taking advantage of the hearings to air their views on the need for the Internal Revenue Department to reform its depreciation rules.

Cause for Friction

Representatives of Small Defense Plants Administration will soon be assigned to military procurement offices to see that small business

Production-Engineering News—p. 113 *The Market Outlook—p. 205*

is utilized to the fullest extent in defense buying. Military buyers won't say so publicly, but they aren't happy about the move. Friction there may negate any potential good that the action could bring.

Renegotiation Aid

A step that's more certain to help small business is that just taken by the Renegotiation Board. Its revised regulations provide specific financial incentives for little subcontractors and it promises the "contractor favorable treatment."

More Inventories

Steel controls continue to be relaxed. The latest action affects inventories. You can now have 60-day stocks of pig iron compared with 30 formerly, 60-day supplies of gray iron castings compared with 45 before, 60-day inventories of rough and semifinished malleable castings compared with 45 formerly and 60-day stocks of rough forgings compared with 45 before. It's significant that those inventory relaxations come too late for many users to take advantage of them by getting in more stocks as a hedge against steel strike.

Business Looks Good

Prospects for business prosperity over the rest of the year are good, despite high taxes and soft spots here and there. Total national production is down about 1 per cent from the 1951 rate, but metals and metals product output is up 5 per cent, soft goods down 6 per cent. Inventories are better balanced than a year ago. Retailers are moaning, but total buying is still high.

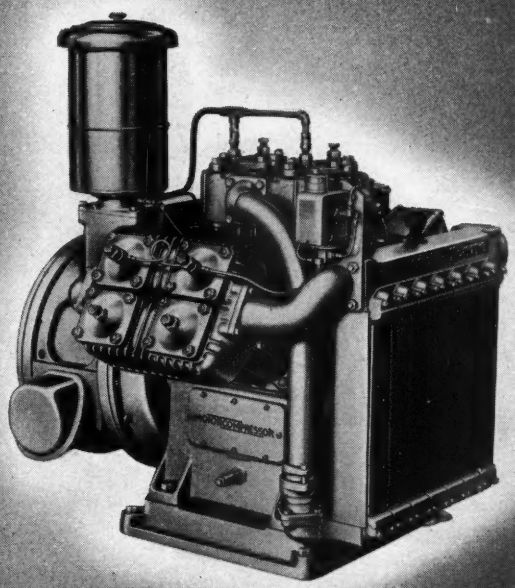
Straws in the Wind

Lincoln Electric Co.'s employee incentive system was vindicated by the U. S. Tax Court after ten years of litigation . . . Westinghouse jacked up suggested retail prices of 20 small appliances . . . Prospective large users of electric power (2000 kilowatts or more) must now get an O. K. of applications for construction permits from Defense Electric Power Administration . . . The drop forging industry will get a tailored price regulation from OPS . . . Motorola will cut prices by absorbing federal excise tax and warranty on its new line of TV sets. . . . A contract for $165 million worth of tanks and motor gun carriages was awarded to the Cadillac Tank Plant, Cleveland . . . Some 80,000 new oil wells will be drilled in the U.S. in the 18 months beginning July. 1.

What Industry Is Doing

A new and smaller CMP is taking shape to take care of defense jobs when and if the present CMP is dropped (p. 85) . . . Bethlehem completes first step in its $100 million expansion program (p. 86) . . . New entries in the titanium race (p. 87) . . . Procurement red tape adds mightily to the cost of doing business with the government (p. 88) . . . "Orgies of production" haunt machine tool builders (p. 89) . . . Gunnison Homes will build a new type of steel military shelter with peacetime possibilities (p. 90) . . . Where 1951's steel went (p. 96).

WHY THEY LIKE THE MOTORCOMPRESSOR



WHAT IS A MOTORCOMPRESSOR?

An Ingersoll-Rand two-stage, air-cooled compressor with a built-in motor . . . made in five sizes from 25 to 75-hp

WHAT IS IT FOR?

Compressing air to pressures up to 125 psi. It is ideal for main air supply . . . or for supplementing the capacity of larger compressors during peak loads . . . or for locations remote from main compressed-air lines . . . or wherever the advantages of air-cooling are important.

WHO LIKES IT?

Maintenance men, engineers, owners, and workers who rely upon a steady supply of Air Power . . . in mills, factories, mines, railroad yards, foundries, construction jobs, and aboard ship.

WHY THEY LIKE IT?

- Air-cooling eliminates the cost of water, water piping, and the danger of freezing.
- Two-stage compression saves power.
- Channel Valves are durable, efficient, stay tight.
- No need for special foundation.
- Compact and lightweight . . . easy to install or relocate.
- Timken tapered-roller main bearings.
- Constant-level lubrication is simple and trouble-free.
- Dual Control provides efficient regulation under any kind of load . . . a selector switch permits use of either constant-speed or automatic-start-and-stop control.
- Dependable in operation . . . easy to service and maintain.
- Built by Ingersoll-Rand . . . by the men who know Air Power, and who build both the compressors that generate it and the tools that use it.

AIR POWER
The Key to Lower Production Costs

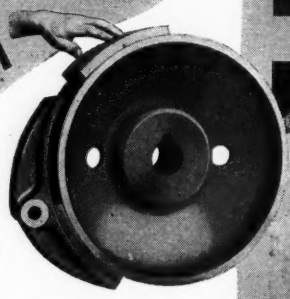
Ingersoll-Rand
11 Broadway, New York 4, N. Y.

1-960

COMPRESSORS • AIR TOOLS • CONDENSERS • CENTRIFUGAL PUMPS • ROCK DRILLS • OIL ENGINES

Type WB Brake showing how the motor armature is easily lifted out. At top left is the handle-nut for compressing the spring when removing motor armature, changing brake shoes and for manual control.

Long Life Brakes for A-C and D-C Motors by EC&M



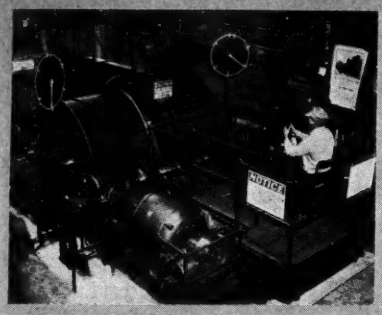
The brake lining is molded to match curvature of wheel and shoe.

Actual wearing thickness, between rivet heads and brake wheel, is 1/8" on the smallest size to 7/16" on the largest size.

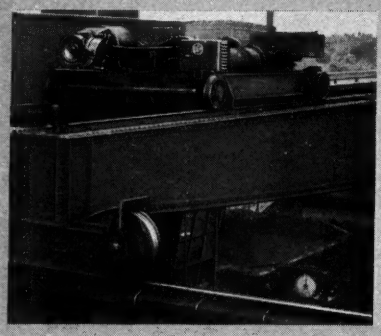
These Type WB Brakes use a block type lining which is both thick and tough.

Furthermore, due to the process of manufacture, the blocks have proper frictional quality *throughout the entire thickness* permitting uniform and complete wear down to rivet heads. And since the material is non-compressionable, brake adjustments are infrequent.

Where You Will SAVE With WB Brakes

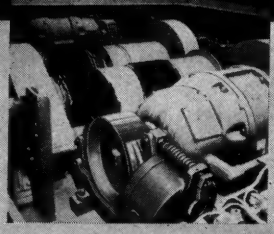


A-C Mine-Hoist Motor with WB Brake



Reduces Delays on Foundry Crane

Bucket-Crane Trolley with WB Brake



WRITE FOR COMPLETE FACTS—Ask for No. 18 ACCELERATOR Bulletin

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Dirty Work

One of President Truman's frequent laments is his difficulty in persuading high-grade men to take positions in the federal government in time of emergency. The resignation of Charles E. Wilson from the important job of directing defense mobilization illustrates clearly why able executives are reluctant to serve in Washington under prevailing conditions.

His resignation came as no surprise to those who are familiar with affairs on the Potomac. Almost two years ago, one of Mr. Truman's able appointees who was fired because of incompatibility with administration policies and tactics declared that a businessman who goes to Washington to serve his country is doomed to failure unless he makes early peace with three powerful factions: 1. The notorious White House "Palace Guard;" 2. the Democratic National Committee; and 3. the labor union pressure bloc, including the hatchet men of AFL and CIO. He offered the then newly appointed Mr. Wilson best wishes for success, but predicted that he would fall a victim to these antagonistic factions.

Mr. Wilson has been victimized as predicted. The nation has lost the services of an able administrator because the President, when faced with a difficult decision, cast his lot with those who place crude politics ahead of the nation's welfare. Mr. Truman's statement that the Wage Stabilization Board's proposals in the steel wage case "are by no means unreasonable and do not, in fact, constitute any real breach in our wage stabilization policies" is—in the President's own favorite phraseology—mere "eyewash."

The harm done by the President's action is incalculable. It has increased tremendously the difficulty of recruiting top-flight executives for government service. It has thrown the steel wage and price negotiations into a mess which could easily result in seizure of the industry, with all of the dangers that action might entail.

The high-handed action of WSB and the President goes far beyond anything Congress intended or authorized. It could be that resentment in the House and Senate may lead to a re-examination by Congress of many questionable and some fraudulent activities which are carried on by the executive branch under the cloak of defense emergency.

E. L. Shaner

EDITOR-IN-CHIEF

FAINT GLEAM OF HOPE: Throughout last week the House Appropriations Committee continued to whittle millions here and there from the President's proposed budget. When members are through with their whittling, the cuts they recommend will be peanuts compared to the $9 billion cut which Sen. Harry Flood Byrd has outlined in detail as feasible.

Truth is that no substantial economy in government can be expected until a brand new ad-

ministration assumes control of government. Now that President Truman has withdrawn from the race, we can take some measure of hope from the fact that not one of the candidates aspiring to succeed him is an avowed free spender. Taft, Eisenhower, Stassen, Warren, Kefauver, Stevenson, Russell, Kerr and any dark horse you care to mention are not money-reckless in the Truman manner.

* * *

HIS EARLY RESENTMENT: President Truman's address at the Jefferson-Jackson Day dinner was particularly vitriolic in its references to American business. One who reads it carefully gets the idea that he thinks most businessmen cannot be trusted and are motivated entirely by self interest. One of the high points in his invectiveness was the statement that the past and present cases of corruption in government are "no worse—no more immoral—than the tax laws of Andrew Mellon. . . ."

This statement speaks volumes for the Truman mentality. In his book "Mr. President," he attributes the failure of the haberdashery business in which he was engaged with Eddie Jacobson—not to any shortcomings on his part or that of his partner—but to what he calls a "wringing-out process" which he blames upon Andrew Mellon.

Mr. Mellon became Secretary of the Treasury only a short time before the Truman-Jacobson business failed. It is doubtful whether any Mellon policies had time to affect the store's affairs. Apparently this early resentment has colored much of President Truman's attitude toward industry, business, fiscal policy and government spending.

* * *

ACCELERATED PROGRESS: On pages 121 and 122 of this issue are three illustrations which, in the words of Author Charles E. Agnew, "tell a story at a glance which would require pages of written words to relate." The first is of the old stone Cornwall blast furnace built at Cornwall, Pa., in 1742. The second shows a stone furnace built in Sharpsville, Pa., in 1846. The third is of the famous No. 5 high pressure blast furnace of Republic Steel Corp. in Cleveland, which was blown in late in 1943.

Here are three historic stacks built at intervals of approximately 100 years. There is little difference in general appearance between the Cornwall furnace of 1742 and the Sharpsville furnace of 1846, but there is a tremendous difference between the latter and the Republic furnace of 1943. Comparisons of the three provide eloquent testimony of the acceleration of progress, particularly in recent years. If advances could be measured by smaller intervals of time, as for instance decades, the speed-up in the recent past would be even more pronounced.

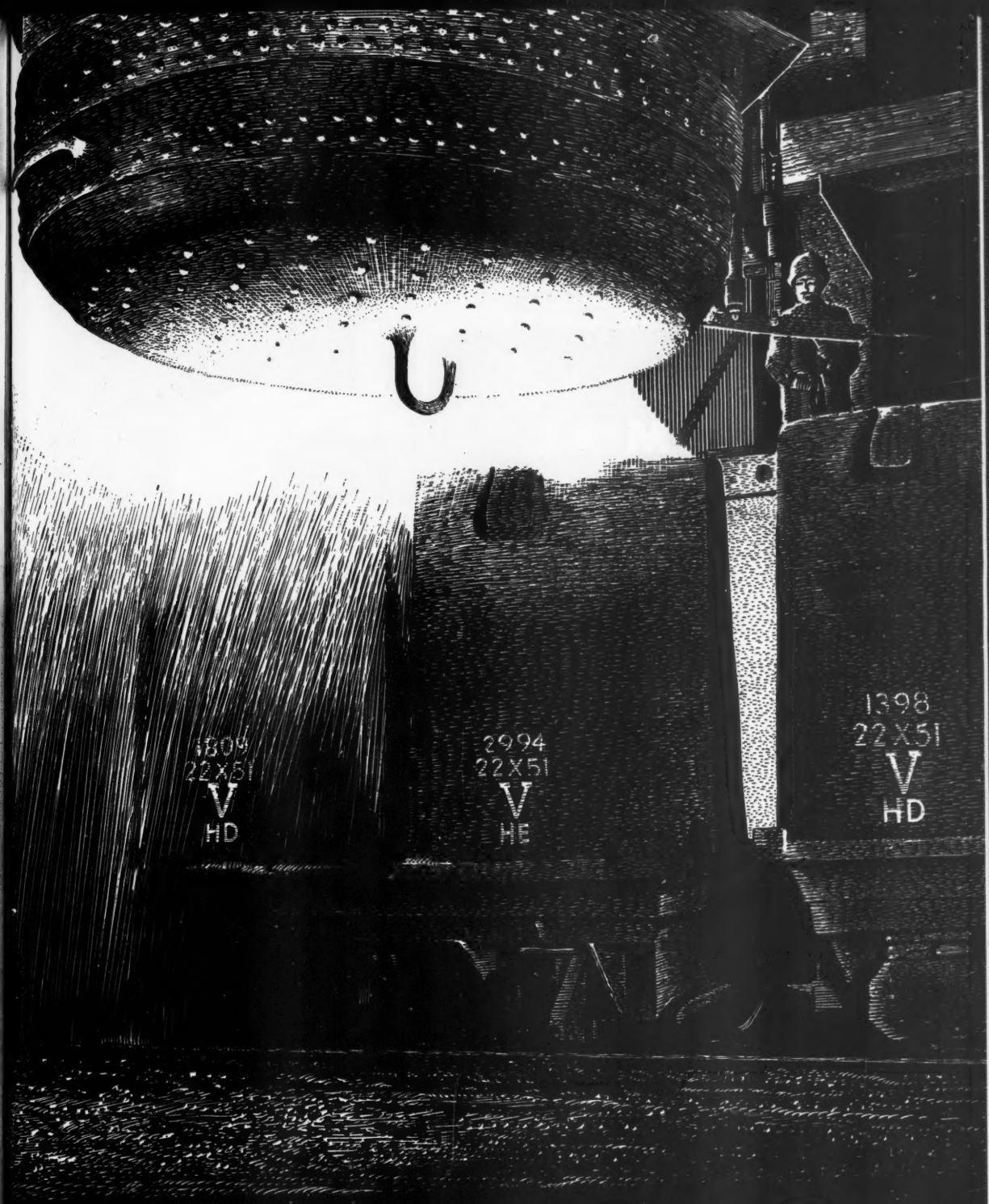
* * *

HEAVY PRESS "SNAFU": Our national face should be blushing with embarrassment over the anner in which we muffed the heavy press problem. Almost as soon as World War II ended, the Russians sensed the importance of heavy presses and while the western allies were quibbling over reparations, the Soviets hurriedly spirited a few of the giants out of Germany and into safe Russian territory. We dilly-dallied for seven years until now a recently created Heavy Press Committee is charged with the difficult task of making up for lost time.

A primary requisite is more adequate facilities for producing heavy steel castings and forgings. Shops specializing in heavy work already are busy with high priority jobs for power plants, iron and steel works and the chemical industries. We need more capacity and we need facilities capable of producing castings and forgings weighing in excess of 250 tons per unit. Industry could have provided these facilities long ago if government planners had advised it promptly of the need.

* * *

WSB EXCEEDS POWERS: House Resolution 532, sponsored by Rep. Leo E. Allen of Illinois, authorizes and directs the House Committee on Education and Labor to investigate whether or not the Wage Stabilization Board exceeded its constituted authority and jurisdiction when it recommended the union shop in the steel wage case. The union shop is a noneconomic issue which should be decided by voluntary agreement between employer and employees. No government body has any right to meddle or exert pressure in this issue. If you believe this, ask your congressmen to fight for H.R. 532 vigorously.



VALLEY MOULD AND IRON CORP.

General Offices: HUBBARD, OHIO

Western Office: Chicago, Ill. • Northern Office: Cleveland, O.

STEEL MINE

If American industry will "mine" its dormant scrap—the obsolete and worn-out machinery and equipment hidden, overlooked and forgotten in its plants and yards—present record-high steel production can continue.

INLAND STEEL COMPANY
38 South Dearborn Street
Chicago 3, Illinois

United Press

Republic's F-84F is shown with all military items it can be fitted with. By fourth quarter the Aircraft Procurement Resources Agency will have the job of production scheduling and allocating aircraft product groups

SPECIAL "A" PRODUCTS

Brackets and Holders, Carburetors, Coil Assemblies, Compressors, Fittings, Load Handling and Storage Equipment, Fuel Injection Systems, Hose, Power Units, Sanitary Equipment, Solenoids, Valves (pneumatic), Valves (engine), Transmission (aircraft).

"B" PRODUCTS

Accumulators, Actuators, Actuators (linear motion hydraulic), Actuators (pneumatic), Air Speed and Machine Indicators, Altimeter (aircraft), Automatic Flight Control Systems, Brakes (aircraft), Brakes, Bourdon Instruments (aircraft), Compasses (aircraft), Conduit (electric, braided, metallic), Coolers (oil and air), Filters (engine and aircraft), Fuel Pumps, Fuel Gages, Gear Motors, Generators, Gyro Instruments, Hardware, Hardware (safety belt and harness), Heaters (aircraft), Indication Instruments, Inverters, Landing Gear Struts, Fractional Horsepower Motors, Hydraulic Motors, Motors (rotary, pneumatic), Hydraulic Pumps, Pilots (automatic), Rate of Climb Indicators, Regulators, Sextants, Spark Plugs, Starters, Tachometers, Temperature and Indicating Instruments, Turn and Bank Indicators, Towing Equipment, Vacuum Pumps, Valves, Wheels.

Limited Controls Plan Takes Shape

New priority system set up for vital defense jobs. It will remain when—and if—CMP ends. Agencies other than NPA may eventually administer the limited controls

A LITTLE controls plan is taking shape within the big Controlled Materials Plan. Its function: To assure that military, Atomic Energy Commission and vital machine tool production can still get priority help when—and if—CMP is finally discarded.

If there's no long steel strike this year, present plans indicate that CMP will be completely dropped by the fourth quarter and that the little controls plan will take over on military, AEC and machine tool programs in time to be functioning fully for that period. The shift to a little CMP has already begun.

Here's How—The first major step to establish that limited controls system is a new priority rating called B-5. Effective Mar. 31, producers of aircraft, tanks, guns, machine tools, AEC products and other vital defense end-items could extend a B-5 to the makers of components that go into the end products. Although use of the B-5 became effective last week, the preference does not become effective for authorized controlled materials orders bearing the B-5 suffix until May 1.

Many components that go into end items are called B products under CMP. The producers of all such items apply for their materials allotments directly to NPA. A B-product supplier with the new B-5 will continue to get his allotments direct from NPA, but the advantage will be that he is supposed to get quicker action from the agency.

New Channels—When—and if—CMP falls away, the B-5 priority setup would remain. In that event, would NPA continue on and administer the limited system? Apparently not, if action taken for aircraft procurement is any gage. By the time the fourth quarter rolls around, the Aircraft Production Resources Agency at Wright Field, Dayton, will take over from NPA on allocations, production scheduling and general processing of CMP-4B applications relating to 42 aircraft product groups that are in CMP's current B-product list, plus 14 others that now go in the A list but that the agency will handle as if they were in the B (see the listings above.)

The reason for the manipulation with the last 14 groups is to give APRA tighter scheduling control over them. The A items under CMP are end products or specialty things, and the priorities for them are handled differently than for B products. Priorities for A items are extended by the customer. That works fine in the case of an airframe or an engine because Uncle Sam is the buyer and can keep close check. But someone else is the buyer for many specialty products also in the A list. APRA is taking over on some of those. Makers of products in the 56 groups should apply to APRA by Apr. 30 for fourth period allocations.

Die Castings: Tables Turn

Problem is not materials, but how much, how soon auto, appliance demand will rise

A SHORTAGE of business is worrying die casters more than a dearth of materials. A couple of months ago, the situation was reversed.

But there's ground for optimism. The relaxation in steel controls has

already helped auto output—the auto industry is the biggest user of die castings—and a corresponding gain has occurred in orders for the castings. Although the pick-up in appliances is not as marked, more steel has been made available for their production, too. Die casters believe they can get enough nonferrous metals to handle a 10 or 15 per cent increase in civilian hard goods production.

Reversing a Trend—More automotive and appliance business would probably reverse a current trend away from zinc castings to aluminum castings. As of January, 1952, dollar volume of the zinc casting business was off 23 per cent compared to January, 1951. The aluminum dollar volume was down only 18 per cent and magnesium was up 40 per cent. Magnesium dollar sales represent only about 8 per cent of the total die casting volume at best, though.

Defense orders last year gave another slight nudge to the trend toward aluminum die castings. Only 8 per cent of the physical volume of zinc castings went to defense orders in 1951, while 17 per cent of aluminum output and 15 per cent of the magnesium production went into military use. Partly through the effects of that trend, die casters are not using all the zinc they can get.

Cause and Effect—Lack of plating materials further slowed zinc die casting in 1951. One firm in Cleveland reports that a customer which formerly took plated zinc die castings has switched to aluminum castings which are then painted. In line with a general easing of materials supplies, though, there are signs that die casters may get more metals like cadmium which permit production of more die castings that could be used without plating.

While defense orders are currently claiming only 8 per cent approximately of the captive shop output and 25 per cent of the job shop output, die casters do not look for a great increase in military business in 1952. Die castings are used mainly on expendable items, and short of an all-out war, they cannot get many long-run production orders which form the backbone of their industry.

BETHLEHEM'S BLAST FURNACE "J"
. . . capacity climbing at Lackawanna

Bethlehem Lights Up

New blast furnace is just one step in $100 million expansion program

"FURNACE J," seventh blast furnace at Bethlehem Steel Co.'s Lackawanna, N. Y., plant, has been lighted. Costing about $12.5 million to construct, the new blast furnace has a rated annual capacity of 600,000 tons of pig iron which will be needed when four new open hearths begin production at Lackawanna soon.

It's all part of Bethlehem Steel Co.'s $100 million expansion program. This year steel ingot capacity of the Lackawanna plant will be raised to 4,740,000 net tons, a boost of 1,140,000 net tons, or over 30 per cent, since Jan. 1, 1950.

Open Hearth Helpers—The four new 250-ton capacity open hearth furnaces will give the plant a total of 34. Auxiliary equipment required for the open hearths includes two charging cranes, charging cars, a 100-ton crane, a 300-ton ladle crane, ladles, cinder cars, locomotives, ingot cars and two 400-ton stripper cranes.

Four more blocks of soaking pits will be installed and the 44-inch blooming mill will be improved. Ore unloading and storage facilities and a battery of 76 coke ovens will be added to the installation. With this new battery, the Lackawanna plant will have a total of 459 coke ovens. Additional facilities for the production of coal chemicals, for distribution of coke oven and blast furnace gas, for power generation and other services are being built.

First Things First—E. F. Martin, plant general manager, says priority was given to construction of the blast furnace because of the national scrap shortage, which forces the industry to use more pig iron in open hearths.

Liberian Ore Aids Republic

Republic Steel Corp.'s company-wide expansion program has nearly doubled its 1930 steelmaking capacity of 5,564,160 tons. In 1951, Republic's steel ingot production exceeded 9 million tons for the first time in the company's history and sales reached a new high of $1,060,371,877. Record - breaking steel shipments in 1951 amounted to 6,993,619 tons of finished steel.

Helping Republic's raw materials supply keep pace with plant expansion is the growing use of high grade Liberian iron ore. Last year 167,262 tons of the 68 per cent iron content ore was imported and Republic hopes this year to jump that to 1 million tons.

While the 1 million tons projected for use this year is only about 10 per cent of the company's needs, imports of Liberian ore are important because they enable Republic to charge the ore directly into steelmaking furnaces.

A-C Builds Taconite Test Plant

Commercial feasibility of continuous heat hardening of taconite pellets will be determined in a cooperative undertaking by Allis-Chalmers Mfg. Co. and Arthur G. McKee Co., Cleveland. A $75,000 pilot pelletizing and heat hardening plant is being built at Carrollville, Wis., for this purpose.

Pelletizing will be done in a balling drum and the "green" (soft) pellets predried in a rotating drum before being fed to a traveling grate. During travel on the grate, the green pellets will be further dried, preheated, ignited and burned. The product from the pilot unit will then be shipped to a blast furnace for test in iron production.

Titanium Researchers Unite

Research facilities of Glidden Co., Cleveland, and Bohn Aluminum & Brass Corp., Detroit, will be pooled to produce pure, ductile titanium, develop special-purpose alloys and devise techniques for fabricating pure titanium and its alloys.

First objective of the titanium research program, which will be conducted on a 50-50 basis between the two companies, is to find a less costly method of producing the metal than any known today. At present, the standard method of refinement is the Kroll process, consisting of the reduction of the metal from titanium tetrachloride through reaction with magnesium under conditions of inert atmosphere.

Research will be conducted at Glidden's research laboratories in Baltimore, and at Bohn Aluminum & Brass Corp.'s laboratories in Detroit.

Titanium Co. of America Formed

Christiansen Corp., Chicago, producer of aluminum and magnesium products, formed a wholly-owned subsidiary named Titanium Co. of America. The firm's new plant, to be located in East Chicago, Ind., will house facilities for the manufacture of wrought products from titanium for industrial and military markets.

DPA Clears More Write-offs

Certificates of necessity for accelerated tax amortization o.k.'d by DPA from Mar. 1 to Mar. 7 include:

Lone Star Steel Co., McAlester, Okla., to write off 75 per cent of $43.9 million; Yolo Steel & Metal Co., Sacramento, Calif., to write off 60 per cent of $7 million, 85 per cent of $30 million and a percentage of $6 million to be determined later; Central Iron & Steel Co., Phoenixville, Pa., to write off 70 per cent of $29 million and Central Iron & Steel Co., Harrisburg, Pa., to write off 75 per cent of $21 million.

Acceleration has now been approved for 8021 new or expanded facilities. Total amount of the proposed investment in these facilities to date is $16 billion.

Who's Making the Heavy Presses for Whom

PRESS CONTRACTOR	PRESS SIZE, TYPE (TONS)	TO WHOM AND WHERE
Mesta Machine	(1) 50,000, forging	Alcoa, Cleveland
United Engineering & Foundry	(1) 35,000, forging	Alcoa, Cleveland
	(1) 35,000, forging	Harvey Machine, Torrance, Calif.
(To be built by Lombard)	(1) 20,000, extrusion	Harvey Machine, Torrance, Calif.
(To be built by Lombard)	(1) 12,000, extrusion	Reynolds Metals, Phoenix, Ariz.
Baldwin-Lima-Hamilton	(1) 25,000, forging	Harvey Machine, Torrance, Calif.
E. W. Bliss	(1) 35,000, forging	
	(1) 25,000, forging	
Loewy Construction	(1) 50,000, forging	Wyman-Gordon, Worcester, Mass.
	(1) 35,000, forging	Wyman-Gordon, Worcester, Mass.
	(1) 25,000, extrusion	Bohn Aluminum, Adrian, Mich.
	(1) 20,000, extrusion	Alcoa, Cleveland
	(1) 12,000, extrusion	Curtiss-Wright, Buffalo, N. Y.
	(2) 8,000, extrusion	Kaiser Aluminum, Halethorpe
	(1) 8,000, extrusion	Reynolds Metals, Phoenix, Ariz.
	(1) 8,000, extrusion	Harvey Machine, Torrance, Calif.

Slow Start Due for Heavy Press Program

Big hitch will be from the lack of heavy forging and casting capacity needed in the building of the mammoth presses in the Air Force program. New facilities may have to be built

THE AIR FORCE'S heavy press program may not get off to as fast a start as expected.

The nation's capacity to produce large castings and forgings—needed in the construction of the presses—is limited. If sufficient facilities to produce such components can't be found, the building of some of the presses will be delayed. A Heavy Press Committee, chairmanned by Col. W. R. Carter of the Air Materiel Command, Wright-Patterson field, is compiling a list of requirements for the presses. It should be completed by the end of April. After that firm orders will be placed for materials and components.

It may be necessary to build new facilities to produce the large castings and forgings. If that is found necessary from a study of the materials and components needed, other problems will loom: Where to get the large machine tools, die-sinking equipment, special heat treating furnaces and other equipment already under tight priority; where to get the skilled pit molders and other skilled workers now at a premium; where to get the builders and managers of the facilities. If worse comes to worst, heavy castings and forgings might be ordered from Europe.

Heavy Thud—For the present 17 presses are in the program. (See the accompanying table.) Some of the engineering work still remains to be done, mostly on design angles. Construction of a 75,000-ton forging press is abandoned for the present although engineering work will be completed. No effort will be made to produce the mammoth job until problems connected with the 17 now under contract are cleaned up.

Of the five contractors for the 17 presses now contracted for, only two will furnish the castings and forgings needed in building from their own shops. They are Mesta Machine Co. and United Engineering & Foundry Co. Although United has contracts for four, Lombard Corp. will build two. A third contractor, Baldwin-Lima-Hamilton Corp. expects to produce the castings and forgings on its own facilities.

Outside Pitch—The other two contractors, E. W. Bliss Co. and Loewy Construction Co., who will build 11 of the 17 presses, will have to get the heavy castings and forgings from outside of their own organizations — and that will be rough.

Of all the presses only one is for work on steel; it is the 12,000-ton extrusion press to be built by Loewy for Curtiss-Wright. All other presses are for aluminum.

Material Handling Expo Coming

The 1953 Material Handling Exposition will be held in Philadelphia at Convention Hall May 18-22. One hundred thirty thousand square feet of exhibit space will be available.

Can Procurement Red Tape Be Cut?

A single federal catalog can cut the cost of doing business with the government, but interservice rivalries cause needless expense to industry and government

DOING BUSINESS with government is expensive as many military suppliers will warrant. The Munitions Board intends to cut the cost of suppliers' doing that business through the use of a tool that it is forging for the biggest buying machine in the world, the U. S. Government.

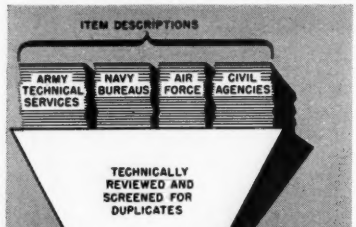
The tool is a single federal catalog system, a means of identifying by name and number all the items the government buys. Through its cataloging system MB can establish a common supply language.

No. 1 Customer—"Without such common language," said the Hoover Commission task force, "an effective program of personal property management borders on the impossible in an operation as vast as that of the federal government." That vast operation will budget in fiscal 1953 alone about $21 billion for procurement and production of materiel: Aircraft (about $14 billion), ships (about $1 billion), tanks, artillery, ammunition, electronic devices and other major procurement (more than $6 billion). Thus metalworking has a huge stake in the business of military procurement—efficiency, economy.

Of the many benefits the cataloging program can achieve, five are significant to industry:

1. Reduced procurement cost by contracting for identical items of identical quality from the manufacturer offering the lowest price. A metalworking company would save itself and the government money by volume production. A firm that could contract for many items could cut down on overhead that it charges for tracing through ramified specifications.

2. Less paper work entailed by the various phases of procurement. One subcommittee found that execution of 10,000 contracts before Korea took an average of 3700 pieces of paper per contract. Any success in cutting down paperwork on bids, drawings, specifications, contracts, instruction manuals would be greeted by huzzahs from military suppliers incessantly swamped with paper.



CURRENT SCOPE of national defense programs altered the Munitions Board's original plans: By June of this year about 750,000 additional items (largely military combat types) will have entered the federal supply system. Because of their importance, many *that are not secret* are described and numbered currently. MB figures it should have its cataloging work "current" by June, 1953. Co-operation between industry and government is essential to insure mutual benefits from federal cataloging, standardization programs

3. Increased procurement efficiency by elimination of confusion as to the detailed nature of procurement items. More than one supplier, confused by detailed specifications (and changes in them) has had to pay through the nose for errors he made.

4. Facilitated standardization which will insure not only low cost to the government but most efficient production from suppliers. A standardization program on 3 to 4-inch bore gasoline engines, announced by the Defense Department, would result in interchangeability of parts regardless of engine make; 1187 different commercial parts would be replaced by 59 standardized parts. (From an understandably selfish angle, though, any one company might worry that since several producers could produce a standardized component, it might lose business.)

5. More single-service procurement and with it computation of total service requirements providing a more clearly defined basis for purchase assignment. Again this could mean volume production and attendant economy—but see below for what can and frequently does happen through single-service procurement.

Co-operation—Such benefits that could accrue from a uniform cataloging system are, of course, ideals. The Munitions Board is well on its way to achieving a good many of them. But its efforts may fall short of the ideal, not because of any inherent weaknesses in single cataloging or in MB's administration but because of the adamant attitude of some military officials on co-ordinating supply management activities.

A report of the Intergovernmental Relations subcommittee of the House Committee on Expenditures in the Executive Departments states: "Attempts at service co-operation are more honored in the breach than in the observance. Interservice rivalries result in needless duplication and wasteful supply practices."

Case Study—What are some of these wasteful practices? Take the case afforded by the experience of a company we'll call "ABC Mfg."

ABC is the supplier of a military end-product (let's call it a "jeet"). The Army, under a single-service procurement set-up, buys all jeets for the military services. If all things were equal, jeets would be the same for the Army, the Navy, the Air Force. But they're not. ABC, realizing that certain accessories on jeets will differ according to the peculiar needs of the different services, is at once resigned to making the necessary deviations involving variations in specifications.

Tie This—But what ABC can't tie is this: The Army as single-service procuring agency for the other two services asks ABC to bid on 300 jeets under three different contracts—100 jeets to go to each service. The Navy, ABC learns, wants its jeets to have a special nameplate (no, the Army's won't do). It also wants 15 copies of a list of all the components that go

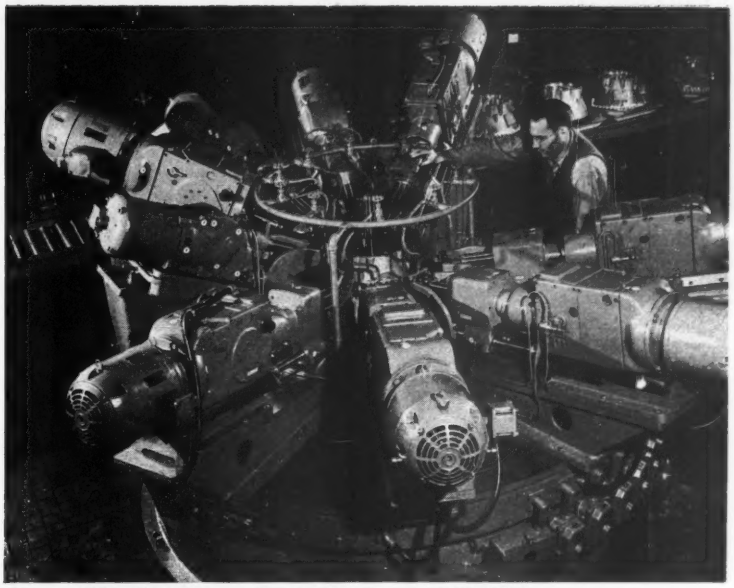
into a jeet (differing from the Army's and the Air Force's requirements about what is listed, how it is listed, and what the size of the paper on which the list is typed should be). The Air Force wants scaled drawings of all jeet components to accompany acceptance of a preproduction model of a jeet (no, the company's scaled drawings won't do). The Navy is satisfied with the instruction manual that ABC uses for its commercial-model jeet, but the Army and the Air Force want a special manual—each one a different one. And so on.

Industrial Viewpoint — From where industry sits, the single federal catalog program can be viewed as a tool to tighten up on military procurement. Eventually it will become a more and more effective tool. But can the Munitions Board use it to put the screws on the different arms of the military service? About that there is much doubt in the minds of congressional watchdogs. One, Rep. Jack Z. Anderson, a member of the Hebert subcommittee of the House Armed Services Committee says "The greatest single threat to the separate, powerful supply empires in the Army, Navy, Air Force and their individual technical services" is a single military catalog.

Surplus Machine Tool Sale

Sixty-two surplus machine tools stored at Marietta, Ga., are being offered for sale by the Air Force. Rejected through a number of screenings as not needed by any governmental agency, the tools are repairable and may be bought by the high bidder to do with as he pleases.

A list of tools available can be obtained by writing Capt. Wm. A. Atchison, USAF Government Plant No. 6, Marietta, Ga. The sale is the first of a series to be held.



Prop Shaft Case Gets It from All Sides

Special equipment like this Kingsbury automatic drill enables the Ford Motor Co. to mass produce giant 28-cylinder Pratt & Whitney engines at its Chicago Aircraft Engine Division. The tool can drill, ream, tap or countersink eight holes in a magnesium propeller shaft case in one operation. Ford delivered its first shipment of the aircraft engines to the U. S. Air Force on Mar. 21

Warning on Tools

Small profits weaken machine tool builders for future building spurts, Westinghouse forum told

MACHINE TOOL builders, answering the call of defense again, warn that only recognition of their problems by administrative branches of government can save them from "orgies of production" and "private depressions in boom times."

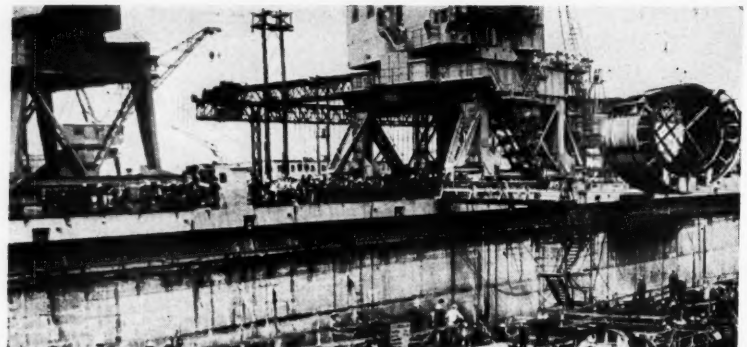
In June, 1950, machine tool builders shipped $3.8 million worth of machine tools. In February, 1952, shipments were up to $81.6 million. Tel Berna, general manager of the National Machine Tool Builders' Association, said in a talk before the Westinghouse Machine Tool Forum, that orders are running around $100 million a month, and the government would like the industry to ship at that rate until the end of 1954 at least.

Going Up — He estimates that there will be about $1 billion worth of orders placed for machine tools from now until the end of 1952. Temporary conditions, which resulted in February, 1952, cancellations running to 49 per cent of orders placed, will not seriously affect the growing 21-month backlog of the industry.

NMTBA President Frederick S. Blackall Jr., in a talk before the Westinghouse forum, called for a permanently operating national machine tool reserve program with detailed and wise procedures for keeping the reserve up to date and methods of disposing of surplus. He also suggests a stand-by plan of priorities to provide for money, men, materials and manufacturing, to be invoked in time of need.

Killing the Goose — Mr. Blackall points out that present tax laws, "a hodge-podge of administrative interpretation and l e g i s l a t i v e amendment," do not take the cyclical nature of the machine tool industry into proper account. The tax policy should be revamped to allow tool builders to build up reserves of cash to carry them over slack periods.

Machine tool builders, which normally do about 25 per cent of their business abroad, are not doing that share today, largely because of government restrictions. Yet, German machine tools can be delivered in Cleveland for 40 to 50 per cent of the cost of comparable American machines.



United Press

Electronics Give Submarine Growing Pains

Modern electronic submarine warfare has outgrown the submarine to such an extent that some of the World War II ships have to be enlarged to hold new equipment. Workmen are lowering a mid-section into the submarine *Pompon* after it was split in two at the Philadelphia Naval Base. A sister ship, *Rasher*, also underwent this treatment as a part of the U. S. Navy's modernization program

Navy Emphasizes Small Firms in Aircraft Speed-Up

THE NAVY is setting its course toward greater aircraft production, and that course will continue to include more and more small firms.

In the current fiscal year, $3.3 billion is earmarked for Naval aircraft and related items. For the first eight months of fiscal 1952, the Navy Bureau of Aeronautics awarded contracts totaling $353 million to firms employing less than 500 workers

Navy says it will continue to shift emphasis to small companies in its procurement policies.

Tapering — At the present time, the Navy expects to increase aircraft deliveries to 300 planes a month by mid-1953. They will continue at that rate through 1954, then taper off to 225 planes a month under present plans.

See the accompanying table for selected metalworking contracts awarded by the government in excess of $200,000 in value:

PRODUCT	CONTRACTOR
Vertical Boring & Turning Machine	King Machine Tool Div., American Steel Foundries, Chicago
Milling Machines	Cincinnati Milling & Grinding Machines Inc., Cincinnati
Hydraulic Pumps	New York Air Brake Co., New York
Parts for Centrifugal Pumps	Dravo Corp., Pittsburgh
Valves	Industrial Pipe & Supply Co., Cicero, Ill.
Gasoline Engine Parts	O'Keefe & Merrit Heavy Equipment Div., Los Angeles
Motor Vehicle Parts	Federal Motor Truck Co., Detroit
Aircraft Parts	M.B. Mfg. Co. Inc., New Haven, Conn.
	Bendix Products Div., Bendix Aviation Corp., Detroit
Wheel Assemblies	Bendix Products Div., Bendix Aviation Corp., Detroit
Indicators	Kollsman Instrument Corp., Elmhurst, N. Y.
Generators	Eclipse Pioneer Div., Bendix Aviation Corp., Detroit
Shells HE 4.2	Rodorn Mfg. Corp., New York
Gun Parts	Colt's Mfg. Co., Hartford, Conn.
Head Assemblies for Rockets	Inland Equipment Co., Nashville, Tenn.
Spacer Assemblies for Rockets	J. R. Wald Co., Huntingdon, Pa.
Ammunition Containers	United Can Co., Phillipsburg, N. J.
Push Buttons & Controllers	Ward Leonard Electric Co., Mt. Vernon, N. Y.
Camera Control System	Allan B. DuMont Laboratories Inc., Passaic, N. J.
Developing Tanks	Sunroc Refrigeration Co., Glen Riddle, Pa.
Radio Sets	Motorola Inc., Chicago
Crystal Units	Westline Electronics Co. Inc., Los Angeles
	Bulova Watch Co. Inc., New York
Adapters	Edwards Mfg. Co., Cincinnati
Multimeters	Caroled Co. Inc., New York
Frequency Meters	Lorel Electronics Corp., New York
Voltimeter Vacuum Tubes	Jetronic Industries Inc., Philadelphia
Tubes, Type 5C22	Bomac Laboratories Inc., Beverly, Mass.
Spare Parts	Philco Corp., Philadelphia
X-Ray Transformers	Westinghouse Electric Corp., Pittsburgh
X-Ray Control Apparatus	Westinghouse Electric Corp., Pittsburgh
X-Ray Tables	Professional Equipment Co., Chicago
Surgical Equipment	Surgical Equipment Div., Air Reduction Co., Madison, Wis.

Steel Shelters for War

Gunnison will fabricate them in a new Pennsylvania plant that may be able to prefab houses

WHAT the Model-T did for the car-buying public in the 1920s, steel houses may do for future homebuilders. And public acceptance of prefabricated steel homes may be hastened by new action by Gunnison Homes Inc.

Already steel companies are looking for ways to use their increased capacities when production outweighs demand. Steel houses may be an answer. As soon as NPA takes the handcuffs off steel allotments, large-scale production of steel fabricated homes could start. And the homebuilder may find he can buy a lot and construct a one-family house on it for as low as $7000.

New Tack—Gunnison, a subsidiary of U. S. Steel Corp., plans to erect a fabricating plant to build a new type of steel military shelter. The company says it will break ground in late May or early June at Shiremanstown, near Harrisburg, Pa. These new shelters may be used in any climate, says the company. They are demountable, portable, fire-proof, termite-proof and hurricane proof. They can be used for one or two-story field hospitals, barracks, mess halls, warehouses, post exchanges or administration buildings.

The company says the structures will be manufactured using assembly line techniques and can be shipped to point-of-use by airplane, if necessary. At the place of erection, the shelters can be stockpiled, regardless of weather.

Double Use — Plants like the Shiremanstown facility could turn easily to production of prefabricated houses for civilian use. From the new plant an area with about 40 million population could be served by truck.

The Gunnison plant—a 260,000-square-foot building, and a two-story office building nearby—will be built of steel and masonry. The facility will employ about 1000 workers. Steel for fabrication will be shipped from U. S. Steel's Irwin Works at Pittsburgh and the new Fairless Plant at Morrisville, Pa.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Controlled Materials Plan

WIRE—Amendment of Mar. 26, 1952, of CMP Regulation 5 and amendment of Mar. 26, 1952, of Direction 1 to CMP Regulation 5 permits printers, publishers and makers of footwear to apply the allotment symbol MRO or the rating of DO-MRO to their delivery orders for certain types of wire products regardless of their accounting practices. The action, effective Mar. 26, was taken because some users carry these types of wire as operating supplies and some do not. The amendment eliminates the inequality.

DISASTER RELIEF—Amendment of Mar. 27, 1952, of Direction 2 to Revised CMP Regulation 6 authorizes building owners to apply for special priority assistance in obtaining materials for reconstruction and repair of damaged buildings in any designated major disaster area.

"B" PRODUCTS—Amendments of Mar. 31, 1952, to CMP Regulations 1 and 3 give materials and parts, including "B" products, needed for military, Atomic Energy Commission and machine tool production the same preference as is accorded the aircraft, tanks, guns and other end-products in which they are used. The amendments provide that defense order priority rating identified by the CMP symbols A, B, C, E and Z-2 may be passed down through the entire chain of procurement. Extension of the symbols A, B, C, E and Z-2 became mandatory Mar. 31. This extension is accomplished by suffixing a B-5 symbol. Preference does not become effective for authorized controlled materials orders until May 1, 1952, time being necessary to permit processing of orders with the new symbol.

Materials Orders

AUTO WRECKERS — Amendment of Mar. 26, 1952, of NPA Order M-92, which covers auto wreckers, brings this order into line with the long-range program of scrap production, rather than with the emergency basis under which it was originally issued. Now, to increase his stock of vehicles he need only to junk pre-1940 models. Heretofore, he has had to junk all pre-1946 models to become eligible to increase his stock of vehicles. The amendment was effective Mar. 26.

RUBBER — Amendment of Mar. 26, 1952, of NPA Order M-2 lifts restrictions from manufacture of white sidewall tires, and increases amounts of natural rubber that may be used in making automotive tires.

MARINE MRO—Amendment of Mar. 31, 1952, of NPA Order M-70 simplifies application of the marine maintenance, repair and operating supplies order to all units of the merchant marine that serve American commerce. The amendment was effective Mar. 31.

ALUMINUM FOIL — Amendment of Mar. 28, 1952, of NPA Order M-67 places aluminum foil under a two-level limitation system to give preferential treatment in filling of orders for essential uses when a converter's allotted supply of foil is insufficient to meet all of his orders. The amendment was effective Apr. 1, 1952.

OIL, GAS OPERATORS—Direction 2 to NPA Order M-46 permits small oil and gas operators who were given priorities assistance in the purchase of oil country tubular goods in the first quarter of 1952 but who have been unable to place their orders to file for new allotments.

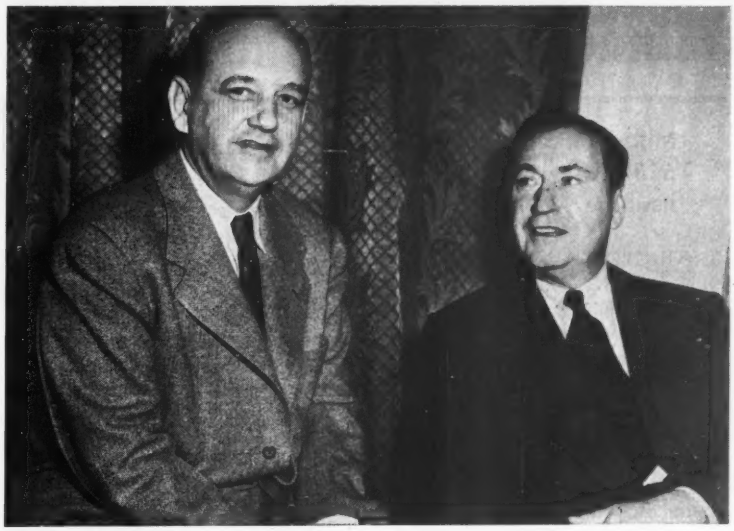
FOREIGN OIL, GAS—Amendment of Mar. 26, 1952, of NPA Order M-46A gives a new definition of "large construction operations." The amendment was effective Mar. 31, 1952.

Price Regulations

CUSTOM SMELTING, REFINING—Supplementary Regulation 94 to the General Ceiling Price Regulation permits custom smelters and refiners of copper, lead and zinc ores and concentrates to adjust their ceiling prices for service charges to reflect certain added costs incurred since July 1, 1951, in accordance with contracts entered into before Jan. 26, 1951, or renewed since then upon the same terms. Also, new contracts or contract renewals under new terms may reflect added costs incurred since July 1, 1951, but ceilings must be in line with charges in effect before Jan. 26, 1951. SR 94 was effective Apr. 1, 1952.

REPORTING REQUIREMENTS — Amendment 43 to Ceiling Price Regulation 22 exempts some manufacturers from using Form 128 in reporting newly established ceiling prices for commodities not sold betwen July 1, 1949, and June 24, 1950. Among those exempted are producers of heating, plumbing and refrigeration equipment and certain valves. It was found that Form 128 was not appropriate in certain fields. Amendment 43 was effective Apr. 5, 1952.

CARGO TANKS, RANGE BOILERS—Amendment 4 of Supplementary Regulation 3 to Ceiling Price Regulation 30 gives manufacturers of automotive truck and trailer cargo tanks and of range boilers the option of determining their ceiling prices under the machinery and related products regulation, CPR 30, or under the General Ceiling Price Regulation. The amendment is effective Apr. 7, 1952.



Eleventh Hour Parley

Price Stabilization Director Ellis Arnall, left, and U. S. Steel President Ben Fairless discuss price aspects of the steel wage case in an eleventh hour attempt to avoid a national steel strike. When this picture was taken, Mr. Arnall was insisting steel producers would get only what the Capehart amendment would grant them. Mr. Fairless was upholding the companies' claim that a $12 a ton price increase is needed to compensate for wages recommended by Wage Stabilization Board

Appointments in Washington

Thomas L. Keeler, Lebanon Steel Foundry, was appointed industrial specialist in the Casting Section, Iron & Steel Division, NPA.

Dr. Zay Jeffries, former vice president, General Electric Co., and vice chairman, Minerals & Metals Advisory Board, National Academy of Sciences, was named a member of the Committee on Materials, Research & Development Board, Defense Department. Other new members are Dr. E. K. Bolton, of E. I. DuPont de Nemours Co., and J. R. Townsend, Bell Telephone Laboratories.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Military materiel is pouring out at a rate 5½ times that of mid-1950 and has tripled in the last year. Armed services near the $4-billion-a-month clip in contract letting

RESTRICTED classification still applies to information about production of individual items of military materiel, but J. D. Small, Munitions Board chairman, tells the story by citing comparisons.

Over-all production in January, 1952, he says, was 5½ times the rate of the three summer months after our troops re-entered Korea. Again, over-all production in January, 1952, was 3 times what it was in the same month of 1951. (These are dollar values.)

The Breakdown—In the year January, 1951, through January, 1952, production of ammunition increased 6 times, electronics equipment 5 times, aircraft 2.4 times, tanks 2.7 times and weapons 2 times.

Mr. Small says recent widespread reports of cancellations of military contracts have no factual foundation. What has happened, he says, is that scheduled peaks of production have been lowered, so that the same volume of production will stretch farther into the future. He admits there have been readjustments in various contracts, and that will always be the case; but the only major changes have to do with timing of deliveries.

Plateau Ahead—Says Mr. Small: The armed services now are letting contracts at the rate of $3.5 billion monthly. This figure will be increased to $4 billion by June. If appropriations by Congress permit, that rate will continue indefinitely.

Another interesting comparison revealed by Mr. Small is that airplane production (by number of planes shipped) in February was 60 per cent of the expected peak; this peak should be reached by January of 1953 and maintained thereafter.

On the Powder Trail . . .

Excellent progress is reported by Navy's Bureau of Aeronautics in its experiments and search in the field of powder metallurgy for materials that may best lend themselves to the production of aircraft gas turbine blades.

Experience to date appears to bear out the theory that such blades would have better operating characteristics, would conserve critical materials and, because they're porous, could be cooled by forcing compressed air through them. The material employed is powder made from 18-8 stainless steel containing a small amount of molybdenum (AISI Type 316), formed into blades a few inches long, 1½ to 2 inches wide and tapering in thickness from about ¼-inch to a wafer edge.

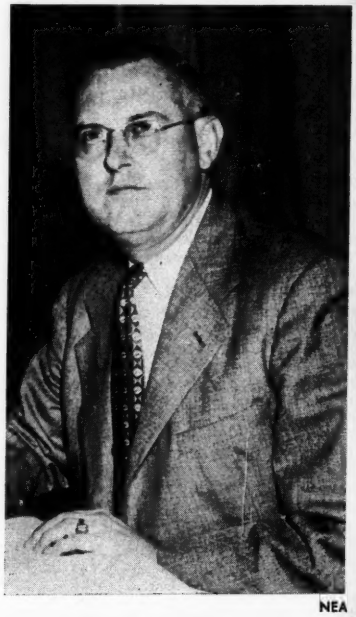
The laboratory work is being conducted by four contractors—Rensselaer Polytechnic Institute, Troy, N. Y., Stevens Institute of Technology, Hoboken, N. J., American Electro Metal Corp., Yonkers, N. Y., and Federal Mogul Corp., Ann Arbor, Mich.

Tapping Industry's Talent . . .

Another sign that the Point Four program (technical assistance to underdeveloped countries) is being better organized, with a view to making it a permanent feature of foreign policy, is the thoroughgoing training of personnel to be sent on assignment.

Thirty-one men and women who are to fill "technical and administrative" positions have completed a 4-weeks' course at the State Department's Foreign Service Institute. They now will be sent abroad by the Technical Cooperation Administration.

It is noteworthy that whereas nearly all those employed under Point Four heretofore had backgrounds in agriculture, health and education, five of the 31 new people have backgrounds in industry—one in the foundry business. The trend toward helping industrialize more foreign countries is gaining.



NEA

Stop-Gap Appointment

Dr. John R. Steelman, assistant to the President, was appointed to the post of temporary director of defense mobilization when Charles E. Wilson resigned on Mar. 30. Mr. Wilson, who said that President Truman changed his mind about the steel wage agreement, had held the position since December, 1950. Dr. Steelman will continue with his duties as advisor to the President

Animal, Vegetable, Mineral . . .

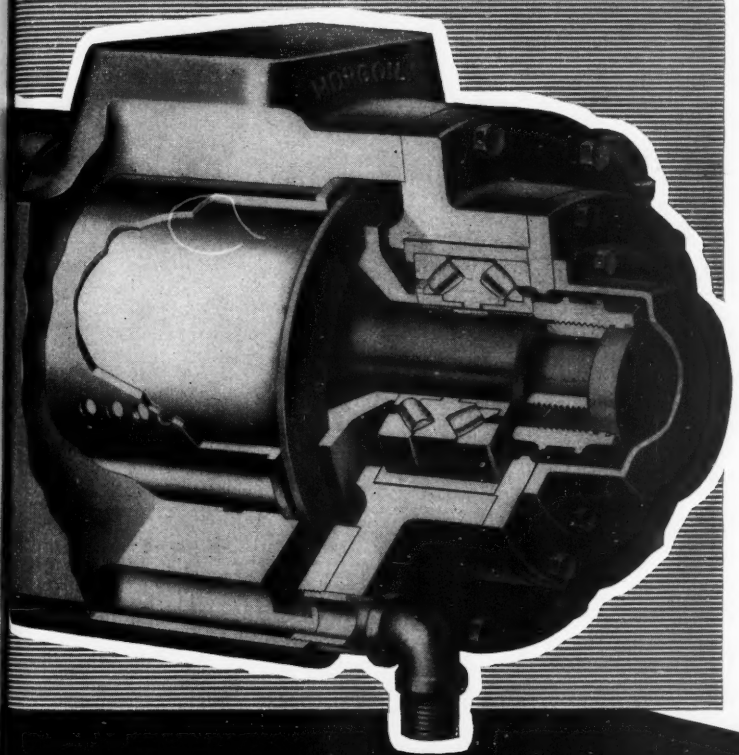
Processed animal fats, treated for deodorization and adjustment of the free-fat-acid content to about 8 per cent, may soon replace palm oil for use in hot-dip tin plate manufacture, according to the Department of Agriculture's Eastern Regional Laboratory. Armour Research Foundation found the material satisfactory in tests.

Details as to particular animal fats to be used and the evolution of a definite processing sequence remain to be worked out. Agriculture's scientists see in this project a potential market for about 15 million pounds of inedible animal fats per year, as well as relief from the present reliance on imported palm oil and the need for stockpiling palm oil.

Morgoil Adopts Aluminum Alloy

IN 1935, Morgan Construction Company, ever on the alert for improvements in roll neck bearings, was a pioneer in the use of cadmium nickel alloys to replace babbitt as the bearing metal in MORGOIL Bearings.

World War II interrupted our research program but **IN 1946** we turned our attention to aluminum alloy bearing metals. Since then we have carried on an extensive investigation in co-operation with the Research and Development Division of the Aluminum Company of America. Aluminum alloy bushings have been tested in MORGOIL Bearings on all types of 2-high and 4-high mills in the plants of many of our customers and have definitely proved their superiority under the most grueling of operating conditions. Now **IN 1952** our production of bushings is being changed to the aluminum alloy type as rapidly as possible. We are confident that this marks another important milestone in the development of the most rugged, dependable and economical roll neck bearings — MORGOIL BEARINGS.



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WORCESTER, MASSACHUSETTS

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WIRE MILLS - GAS PRODUCERS - AIR EJECTORS
REGENERATIVE FURNACE CONTROL

English Representative: International Construction Company, Ltd, 56 Kingsway, London, W.C. 2, England

MB-20

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ROLL NECK BEARINGS

Basic as a Plowshare...

. . . the fasteners that hold together the many parts comprising modern machinery. Only fasteners of the highest quality provide the resistance to vibration and stress necessary to assure years of reliable service. And Chandler specializes in one endeavor: the production of uniformly high quality cold wrought metal fasteners. Whether you manufacture farm implement, automotive, aviation, transportation or other types of equipment specify Chandler fasteners for maximum dependability.

★ COLD WROUGHT METAL FASTENERS BY

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1491 CHARDON ROAD • CLEVELAND 17, OHIO

Sky-High Construction

Contractors see a busy year—with more accent on commercial, less on civilian industrial jobs

GET OUT your pencils and slide rules and start refiguring the deferred construction jobs for commercial and civilian industrial projects.

That's the word to architects and engineers from American Institute of Steel Construction, which foresees a nice spurt for builders in the last half of the year now that the government has eased up on controls (STEEL, Mar. 24, p. 41).

Optimistic—A long steel strike would tighten up construction controls again, but most contractors are going ahead with their planning as if the structural steel shortage is a thing of the past. They have to operate that way so they can be ready no matter what happens. Long lead times in their business mean they must plan and order now for third and even fourth quarter starts. The way it looks today, copper will be the most serious limiting factor.

An estimated $600 million worth of civilian construction jobs await an o.k. from Washington, and contractors believe even more will materialize from people who never made a request for governmental approval because they didn't think they had a chance. Inquiries to the builders regarding civilian projects have been unusually numerous.

The Commercial Touch—Commercial projects—stores, gas stations, super-markets—will get the biggest play in the last half, believes M. B. Parker, president of M. B. Parker Co., contracting firm in Pittsburgh. Housing will do fairly well, but financing will be the problem there. That and rising costs will dampen the enthusiasm for many multiple housing jobs and other speculative building depending solely on rents for the return on an investment. Public works, notably schools, will do well. Most contractors agree that the activity in strictly civilian projects relating to manufacturing will not be outstanding.

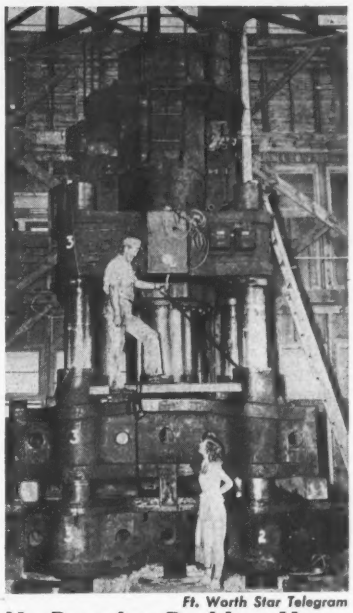
The small contractors will benefit the most from government relaxation of controls because the bulk of the projects that will be able to go ahead are small. Most small firms needing new quarters will want the contractors to go ahead with the job even if costs are rising because they will still realize savings in their operations with more modern facilities.

Pipeless Presses Cut Downtime

Hydraulic presses built on pipeless construction principle are providing valuable tools for producing artillery projectiles. Built by American Steel Foundries, Elems Engineering Division, Cincinnati, two have been installed and others are under construction.

Advantages are said to result from elimination of conventional high pressure piping from the main hydraulic circuit. All high-pressure fluid in the main circuit is conducted through short, direct passages drilled in the structural parts. There are no high-pressure screwed joints to loosen, no oil dripping from loosened fittings and no welded joints to break.

Result is greater freedom from downtime and maintenance expense from high-pressure difficulties.



Ft. Worth Star Telegram

No Pressing Problem Here

On this 220,000-pound hydraulic metal forming press, Marine Aircraft Corp., Ft. Worth, Tex., stamps out half-shells for 300-gallon wing-tip fuel tanks used on Navy and Marine fighter planes. The tanks were used for napalm bomb cases in the Korean War

Stampers Hope To Catch Up with Defense Work

THERE MAY be a break in the clouds for jobbing stampers before the end of 1952.

Caught last year between shrinking civilian markets and lack of defense work, stampers now have two possible outs in sight. Requirements for stepped-up automobile production (the stamper's best peacetime outlet) may soon filter down to their level and/or defense work which is getting off the drawing board may result in more long production-run orders. During World War II, aircraft parts, electronic devices, auto, truck and tank parts were among the stampers' biggest markets, reports E. M. Ross, of Pressed Metal Institute.

Some Recovered—Stampers were hurt in the last half of 1951, when their biggest single customer, the automotive industry, cut back purchases to less than half of the early 1951 volume. Some stampers won't recoup all this loss, as the auto companies have drawn their horns in further and tend to do more stamping work themselves.

Better off are stampers who were not strictly automotive suppliers. They were hurt, too, in 1951, but managed to expand military and "all other" order classifications to where the industry as a whole showed total sales of $1.38 billion in 1951 compared to $1.33 billion in 1950. Military orders particularly give added hope for late this year. Since stampers compose a "subcontracting" industry, it is only after the defense program is integrated and begins to gather speed that stamping needs rise.

Back to Normal—Easing materials supplies have allowed most stampers to return to their normal buying habits. Mills and warehouses thus furnish the bulk of supply.

Scattered stampers still predict a 15 to 25 per cent drop off in sales for 1952. But, most believe they can see light through the clouds with military orders slowly increasing, automobile production strengthening and a 40-week backlog in "all other" type orders.

Here's Where the Steel Went in 1951

Impact of defense program was eased somewhat by record-breaking shipment of steel from mills

NOW you can see where all the steel went in 1951—when maybe you weren't getting all you wanted.

The American Iron & Steel Institute just released its tabulation of shipments of the various forms of steel to the various classifications of buyers for that year.

Impact of the defense program stands out clearly in the report: There were increases in steel shipments to ordnance and other military, shipbuilding and marine equipment, forgings, rail transportation, and machinery, industrial equipment and tools classifications. Giving way for the defense program were, notably, the automotive and appliances, utensils and cutlery classifications.

The defense impact was softened somewhat by a record-breaking shipment of 78,928,950 net tons of finished steel from mills. Consumers could get a smaller percentage of the nation's shipments and still come out pretty well as far as tonnage was concerned.

Increases to ordnance and other military gave that classification 1.52 per cent, or 1,200,211 net tons, of total mill shipments of finished steel in 1951. In 1950, it received 0.27 per cent and 194,614 tons.

Shipbuilding and marine equipment in 1951 got 1.12 per cent and 884,210 tons. Its 1950 take was 0.45 per cent, or 327,413 tons.

DISTRIBUTION OF FINISHED STEEL PRODUCTS

In net tons of products of all grades, including alloy and stainless.

Market Classification	Ingots, Blooms, Billets, Slabs, Sheet Bars, and Seamless Tube Rounds	Skelp	Wire Rods	Structural Shapes (heavy)	Steel Piling	Plates	Standard Rails (over 60 lb)	Rails (all other)	Joint Bars	Tie Plates
Converters, Processors	1,245,393	51,916	317,778	1,625	.....	398,276	58	16	6,139	9
Forgings (except automotive)	973,966	.....	6,866	.....	.....	12,635	.....	.....	..	....
Bolts, Nuts, Rivets, Screws	25,027	.....	286,977	.....	.....	8,282	.....	.....	.....	.....
Jobbers, Dealers, Distributors	108,298	3,796	60,247	909,745	22,934	1,088,137	6,147	14,549	2,217	1,384
Construction, Maintenance	139,064	603	20,506	2,489,659	338,269	1,659,596	103,495	16,217	3,755	13,379
Contractors' Products	12,562	.....	32,078	12,760	.....	160,497	.....	.....	.....	.....
Automotive	422,604	.....	32,001	49,995	.....	514,426	.....	.....	.....	.....
Rail Transportation	52,559	.....	474	603,732	425	1,408,873	1,458,210	19,352	107,812	409,575
Shipbuilding, Marine Equipment	9,500	.....	41	146,009	6,916	571,534	616	421	1	.....
Aircraft	19,295	.....	281	5,028	.....	11,720	.....	.....	.....	.....
Oil and Gas Drilling	65,776	.....	97	50,116	82	155,865	.....	.....	.....	.....
Mining, Quarrying, Lumbering	2,366	.....	166	32,611	171	93,782	22,591	46,074	3,791	3,732
Agricultural	37,949	.....	9,085	59,093	.....	154,956	.....	.....	.....	.....
Machinery, Industrial Equip., Tools	149,453	.....	45,809	273,053	.....	1,058,014	14,020	5,651	504	124
Electrical Machinery and Equipment	4,220	208	8,702	28,670	.....	153,317	.....	.....	.....	.....
Appliances, Utensils, Cutlery	2,025	.....	139	1,327	.....	9,694	.....	.....	.....	.....
Other Domestic, Commercial Equipment	5,055	.....	8,150	3,197	.....	15,343	.....	.....	.....	.....
Containers	9,178	.....	970	1,360	.....	21,921	.....	.....	.....	.....
Ordnance and Other Military	119,477	.....	635	24,037	86	234,304	1,151	.....	.....	1
Export	67,568	95,951	5,106	217,561	30,190	157,153	92,754	3,485	7,192	17,728
Unclassified	84,258	.....	11,207	12,392		22,269		14,950	762	.....
Total	3,555,593	152,474	847,369	4,921,970	399,073	7,910,594	1,699,042	120,715	132,173	445,932

Market Classification	Mechanical Tubing	Pressure Tubing	Wire, Drawn	Nails and Staples	Wire, Barbed and Twisted	Woven Wire Fence	Bale Ties	Black Plate	Tin and Terne Plate (hot-dipped)	Tin and Terne Plate (electrolytic)
Converters, Processors	10,444	1,969	1,086,535	1,239	215	8	22	5,534	111	423
Forgings (except automotive)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bolts, Nuts, Rivets, Screws	58	.....	387,164	.....	.....	.....	.....	.....	.....	.....
Jobbers, Dealers, Distributors	175,704	80,763	354,540	782,557	187,612	406,561	105,581	123,640	41,040	76,279
Construction, Maintenance	29,527	18,857	50,138	20,758	22,222	5,374	254	7,164	2,320	3,542
Contractors' Products	41,451	15,423	64,951	1,194	239	22	.....	32,941	2,602	1,378
Automotive	161,450	424	302,352	1,049	.....	.....	.....	16,943	3,404	3,161
Rail Transportation	5,155	7,088	2,602	6,362	767	1,403	.....	123	518	30
Shipbuilding, Marine Equipment	5,338	3,037	960	113	25	.....	.....	.....	10	37
Aircraft	9,364	615	2,368	119	.....	.....	.....	.....	.....	159
Oil and Gas Drilling	10,835	3,197	199	21	.....	.....	.....	.....	152	.....
Mining, Quarrying, Lumbering	2,819	110	1,885	1,070	16	120	.....	39	.....	.....
Agricultural	35,549	95	24,819	691	119	145	.....	224	54	1,325
Machinery, Industrial Equip., Tools	249,830	84,836	157,202	5,318	.....	.....	.....	6,345	6,423	10,437
Electrical Machinery and Equipment	11,765	1,515	88,199	447	.....	.....	.....	6,349	1,450	1,051
Appliances, Utensils, Cutlery	9,555	3,543	45,400	651	.....	.....	.....	64,441	10,265	13,074
Other Domestic, Commercial Equipment	60,579	60	352,072	1,218	.....	131	.....	95,603	9,818	4,229
Containers	2,842	.....	109,356	18,428	24	.....	4,184	683,754	1,194,370	2,535,557
Ordnance and Other Military	36,035	719	6,759	7,005	10,896	170	99	135	9,794	975
Export	8,058	8,827	67,621	10,857	15,669	2,739	130	33,061	346,231	235,472
Unclassified	113,708	101,352	114,707	5,736	1	31	137	.....	.....	.....
Total	980,066	332,430	3,219,829	864,833	237,805	416,704	110,407	1,076,296	1,628,562	2,887,129

Forgings (except automotive) took 1.96 per cent, or 1,550,151 tons in 1951, compared with 1.5 per cent and 1,082,309 tons in 1950.

Rail transportation received 7.33 per cent, or 5,781,589 tons, in 1951. Its 1950 take was 5.95 per cent and 4,299,346 tons.

The classification of machinery, industrial equipment and tools got 5.38 per cent and 4,245,167 tons in 1951, compared with 4.81 per cent and 3,473,896 tons in 1950.

Although the automotive classification received less steel in 1951 than in 1950 it continued to rank as the nation's No. 1 consumer of steel. Its 1951 take was 16.45 per cent and 12,982,356 tons, compared with 20.04 per cent and 14,472,707 tons in 1950.

The appliances, utensils and cutlery classification received 2.33 per cent, or 1,836,807 tons in 1951, compared with 2.89 per cent and 2,087,853 tons in 1950.

Where Alloy, Stainless Steel Went

	Alloy (other than stainless) —net tons—	Stainless —net tons—
Converters, Processors	87,141	45,012
Forgings (except automotive)	706,476	15,240
Bolts, Nuts, Rivets, Screws	105,111	6,594
Jobbers, Dealers, Distributors	415,632	126,384
Construction, Maintenance	100,515	10,944
Contractors' Products	31,905	13,392
Automotive	1,873,538	85,346
Rail Transportation	220,827	4,307
Shipbuilding, Marine Equipment	28,782	1,640
Aircraft	61,171	33,583
Oil and Gas Drilling	157,271	1,460
Mining, Quarrying, Lumbering	27,118	680
Agricultural	49,474	339
Machinery, Industrial Equip., Tools	680,145	47,546
Electrical Machinery and Equipment	531,791	17,742
Appliances, Utensils, Cutlery	35,782	46,156
Other Domestic and Commercial Equip.	26,421	14,771
Containers	20,488	2,406
Ordnance and Other Military	252,282	8,790
Export	106,050	10,054
Unclassified	208,023	47,124
Total	5,725,943	539,510

BY MARKET CLASSIFICATION DURING 1951

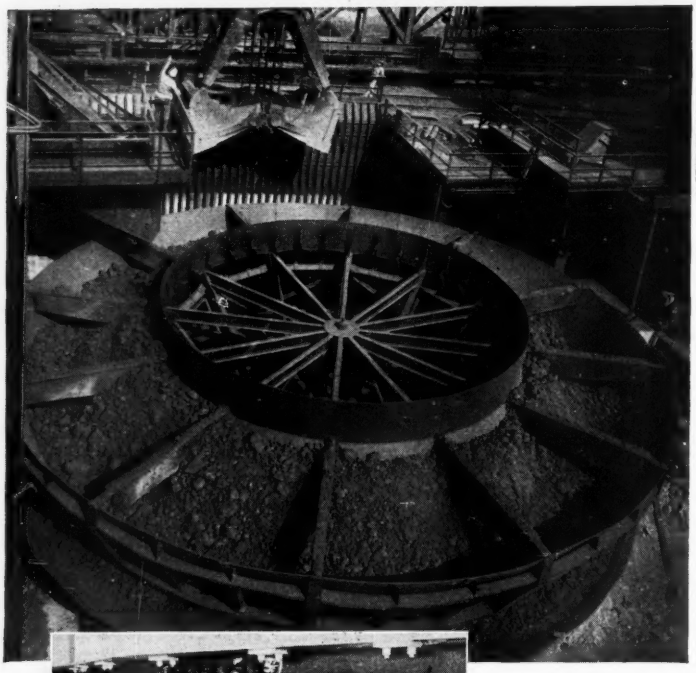
Tables compiled by STEEL from American Iron & Steel Institute figures.

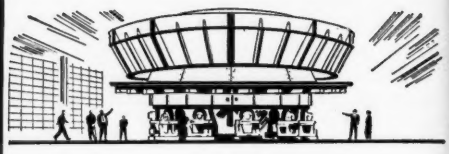
Track Spikes	Wheels	Axles	Bars, Hot-Rolled (and light shapes)	Bars, Concrete Reinforcing	Bars, Cold-Finished	Bars, Tool Steel	Standard Pipe	Oil Country Goods	Line Pipe	Market Classification
20	40	.....	207,164	1,351	14,372	1,427	9,649	1,465	431	Converters, Processors
.....	.....	.....	552,003	.....	3,523	1,158	.....	.....	.....	Forgings (except automotive)
.....	.....	.....	679,424	.....	119,585	44	.....	.....	.....	Bolts, Nuts, Rivets, Screws
10,621	79	.....	1,240,096	879,337	485,132	28,513	2,051,610	1,373,119	645,095	Jobbers, Dealers, Distributors
3,643	6,240	1,160	535,602	811,619	8,944	182	182,605	24,869	2,140,234	Construction, Maintenance
.....	.....	.....	255,256	34,187	20,504	35	180,652	.....	12,096	Contractors' Products
.....	.....	.....	2,470,791	.....	442,552	323	5,963	.....	138	Automotive
132,943	374,384	216,988	467,491	3,544	9,695	243	23,671	.....	601	Rail Transportation
2	686	.....	56,367	452	3,427	130	11,818	.....	13,102	Shipbuilding, Marine Equipment
.....	.....	.....	29,637	.....	25,824	76	3,141	.....	305	Aircraft
.....	.....	.....	133,506	247	9,873	8	10,948	306,510	40,504	Oil and Gas Drilling
2,616	2,330	125	95,704	1,955	6,128	384	11,011	5,351	4,963	Mining, Quarrying, Lumbering
.....	.....	.....	580,054	101	106,183	74	28,066	.....	1,587	Agricultural
185	11,901	1,873	884,358	.....	342,408	22,684	60,365	724	35,515	Machinery, Industrial Equip., Tools
.....	3	.....	133,473	.....	35,092	954	224,116	.....	2,120	Electrical Machinery and Equipment
.....	.....	.....	22,650	.....	40,225	683	11,057	.....	206	Appliances, Utensils, Cutlery
.....	.....	.....	96,495	57	49,224	146	5,315	.....	2,072	Other Domestic, Commercial Equipment
.....	.....	.....	13,886	.....	45	4	5,285	.....	1,257	Containers
523	21	14	203,612	351	121,082	78	7,031	.....	2,242	Ordnance and Other Military
7,853	877	927	120,929	70,362	7,744	345	99,528	166,442	283,476	Export
.....	.....	10	152,135	96,562	84,261	113,565	1,490	736	894	Unclassified
158,406	396,561	221,097	8,930,633	1,900,125	1,935,823	171,056	2,933,321	1,879,216	3,186,838	Total

Sheets, Hot-Rolled	Sheets, Cold-Rolled	Sheets, Galvanized	Sheets (all other) Coated	Enameling Sheets	Sheets and Strip Electrical	Strip, Hot-Rolled	Strip, Cold-Rolled	Net Total	Per Cent of Total	Market Classification
360,817	58,280	28,494	1,916	563	.....	281,337	91,115	4,186,151	5.30	Converters, Processors
.....	.....	.....	.....	.....	.....	.....	.....	1,550,151	1.96	Forgings (except automotive)
63,989	4,344	316	.....	.....	.....	8,187	15,338	1,598,735	2.03	Bolts, Nuts, Rivets, Screws
1,078,767	963,807	745,146	36,150	3,764	9,954	180,152	116,359	14,399,432	18.24	Jobbers, Dealers, Distributors
488,848	142,193	169,754	1,978	1,930	397	86,142	32,461	9,583,500	12.14	Construction, Maintenance
680,860	662,157	495,484	17,359	30,820	1,756	132,263	178,746	3,080,273	3.90	Contractors Products
2,406,054	4,718,855	34,743	125,314	1,347	15,438	638,065	614,964	12,982,356	16.45	Automotive
297,237	28,404	73,306	96	96	14,759	49,214	3,857	5,781,589	7.33	Rail Transportation
25,087	7,474	18,295	140	3	80	2,461	128	884,210	1.12	Shipbuilding, Marine Equipment
18,850	14,319	1,206	369	110	1,053	931	6,009	150,779	0.19	Aircraft
43,082	708	388	.....	.....	186	1,799	533	834,632	1.06	Oil and Gas Drilling
19,984	2,637	2,687	73	.....	256	5,694	1,528	374,769	0.47	Mining, Quarrying, Lumbering
223,661	109,146	126,268	7,397	1,619	402	121,338	8,456	1,638,456	2.08	Agricultural
396,281	132,175	26,789	9,828	534	6,861	128,395	117,272	4,245,167	5.38	Machinery, Industrial Equip., Tools
203,606	235,060	26,534	7,155	4,049	629,912	78,813	134,343	2,021,123	2.56	Electrical Machinery and Equipment
244,792	917,631	75,182	27,920	129,914	24,776	25,406	156,251	1,836,807	2.33	Appliances, Utensils, Cutlery
173,948	738,589	43,444	6,763	4,754	3,341	73,313	277,753	2,030,669	2.57	Other Domestic, Commercial Equipment
857,298	595,559	45,631	3,991	321	.....	240,307	178,426	6,523,954	8.27	Containers
208,746	122,718	4,945	2,002	110	725	44,961	28,772	1,200,211	1.52	Ordnance and Other Military
199,546	186,634	63,762	8,744	1,696	47,740	47,934	26,465	2,764,411	3.50	Export
179,280	270	2,587	.....	557	225	60,266	87,227	1,261,575	1.60	Unclassified
8,170,733	9,640,960	1,984,961	257,195	182,187	757,861	2,206,978	2,076,003	78,928,950	100.00	Total

HYATTS PREFERRED

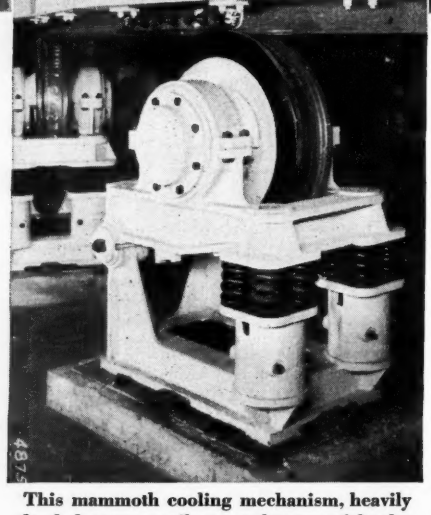
For New Equipment or Changeovers





This Rotary Cooler licensed under U. S. Ser. Nos. 519322 and 613368 is a recent development of the Arthur G. McKee Company and was built by The William B. Pollock Company for one of the leading steel mills.

As a result of the successful performance of this original unit, other mills have since installed similar Hyatt-equipped coolers on their sintering plant operations.



This mammoth cooling mechanism, heavily loaded, turns easily on a battery of husky Hyatt-equipped track wheels as shown above.

Wherever wheels, gears and shafts turn in steel mills you will find Hyatts carrying heavy loads, eliminating bearing wear and care and helping equipment operate easier and last longer.

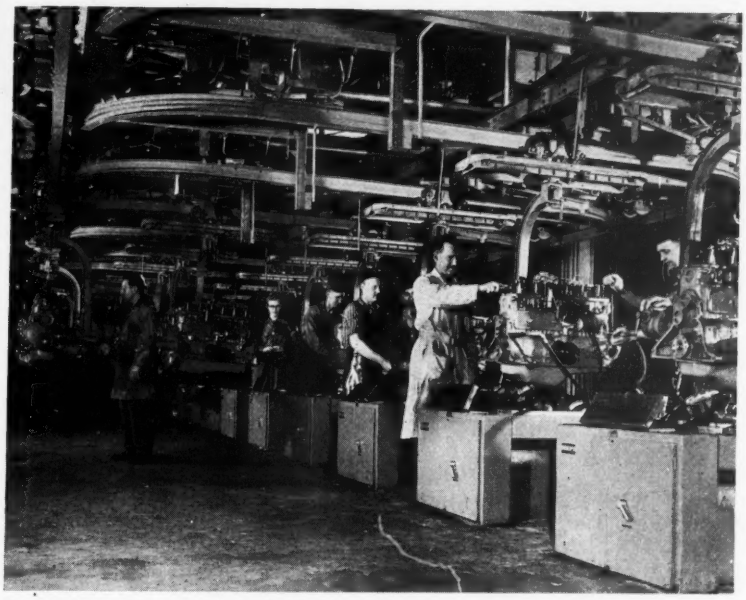
Whatever the application—rotary coolers as illustrated—or tables, cars, cranes, mill motors or other auxiliary equipment, there are Hyatt Roller Bearings in sizes and types to suit most every requirement.

Having served in steel mills so well for so many years, Hyatts are far out in front today as the preferred bearings for new equipment or changeovers. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom



Upside Down Switching Yard at Ford Plant

Looking like a railroad switching yard turned upside down, this conveyor system at Ford Motor Co.'s new engine plant in Cleveland eliminates all manual handling and use of chain-falls or hoists in the transfer of heavy components during assembly and testing operations. It has main lines, switches and sidings for co-ordinated and straight-line flow. In the operation above, the "hot test" brings life to 6-cylinder overhead valve engines in a 20-minute running test

Ford's new engine plant, a wonderland of motordom, goes a long step further in automaticity than pushbutton control of machinery. It utilizes electric nerve centers

DETROIT

OUTSIDE, the chorus of thousands of frogs vigorously protests the encroachment of humans; inside, the symphony of machinery drowns out their complaint.

Scene is the new Ford engine plant on Brookpark road in Cleveland. Only months ago a marsh, its site now is the location of one of the wonderlands of motordom. Shortly the foundry, behind the engine plant, will loom as a marvel of the ancient art of casting.

Only a stone's throw from the municipal airport and within spitting distance of the Chevrolet plant which, until Ford moved in, dominated the landscape, the engine plant sprawls over a vast acreage, contains more than one million square feet of working space.

House of Magic — Impressive though it is on the outside, the real eyeopeners are within its walls. The machinery set up to give new form to the concept of "automation" is without parallel anywhere in the automotive industry, or in any other industry for that matter.

"Automation" is the catch-word coined some years ago by Del S. Harder, Ford vice president, manufacturing, to describe the automatic handling of materials through and between machining and fabricating operations. Two years ago (STEEL, Apr. 3, 1950, p. 102) the progress which Ford had made in applying this concept to its metal forming operation was described in detail.

In most previous applications of automation, the key device for moving materials between operations was the "iron hand." Because of the nature of materials used in the engine plant, mostly cast iron, the hand is replaced by what might be called an iron arm.

Pushbuttons Outmoded — Ford's new plant goes a long step further in automaticity than pushbutton control of the machinery. There are in fact very few control panels with buttons waiting to be pushed. Instead, electric nerve centers—40 of them—direct the operation of the engine block and head lines virtually without human handling.

Electric switches along a particular line constantly inform the nerve center of the progress of work in process; they tell the "brain" what machines are waiting for work, where the incoming parts are at all times.

The brain then directs the arms and fingers to bring the piece into a given machine and tells the machine to get busy on it. With a degree of co-ordination which would be impossible for the most proficient human tummy-rubber-and-head-patter to duplicate, this brain center simultaneously is telling all the other tools and arms what they are to do, directing that parts be pushed off onto sidetracks and into duplicate tools when one's capacity is being taxed or if it becomes inoperative because of mechanical trouble.

Department Is a Tool — Most striking spectacle in the plant is the cylinder block machining department. This department consists of what the Ford engineers refer to as one tool. This is a transfer machine at its most highly developed state. Taking in the rough engine casting as it comes from the receiving department, this "tool" ejects a finished engine block ready for assembly. The department and its tool takes up a space of 46,200 square feet—more than one acre. The components of the machine, of course, are individual transfer-type machine tools to perform a multiplicity of operations. Seven hundred feet of the unit's length is accounted for by the special purpose machine tools;

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the remaining 845 feet is used by the conveying mechanisms.

Figures, usually impressive, fail to bring the entire device into its proper perspective. In all there are 42 automatic machine tools in the line, these ranging from peewees measuring only six feet long and weighing a half-ton to monsters stretching 96 feet in length and weighing 70 tons. Twenty-seven of these machines are of the special purpose variety, 16 of the total perform in all 530 machining operations. Duplication in the line to prevent bottlenecks where one machine could not keep up with others brings the total to 42.

Automation Everywhere—Automation of a similar degree but smaller scale is also found in the cylinder head line where the most spectacular machine is a giant miller-broach-drill combination. Other components of the engine are manufactured and/or machined and inspected with unique automatic devices. Conveyorization is extensively practiced, but the more prosaic cranes and trolleys fail by comparison with the fully automated lines to point up the extreme degree of mechanization throughout.

Two operations, aside from these performed on the block and head, are stand-outs. Both are done on the new nodular shell-molded iron of which the crankshaft and camshaft are cast. One is a combined balancing and machining operation for the crankshaft. The other is a grinding operation on the faces of the 12 cam surfaces of the camshaft. The Tinnius-Olsen crankshaft balancers—seven being required to handle the plant's requirements—have electronic brains and memories which drill away excess metal wherever necessary to bring the cranks into perfect balance. The Landis grinders, automatically following a master camshaft built into the machine, grinds each cam to its proper contour.

People Still Needed—Possibly in some plant at some far-away date, a completely automatic operation will spring into being. The only place human beings may be necessary will be in the front office at control boards watching that machinery is taking materials off the freight car properly and that everything is going smoothly until the completed widgets are shipped out. The Ford plant fails of this automatic plant notion. Currently about 1100 people are employed.

Of machine operators, however, there are not many. Many of the smock wearing men around the automated lines carry the title of supervisor, and a good many of the people who are watching the operations are not button-pushers but rather electricians and mechanics, ready to jump into action.

Conventional — Assembly of the engines is done in fairly conventional fashion, assistance coming from machinery and conveyors insofar as possible to minimize the amount of human effort.

Today's production at the plant is exclusively the new overhead-valve six-cylinder engine, used in the Ford passenger car and with modifications on some of its trucks. Management is working feverishly to add within the plant an equally automated line on which a new overhead-valve V-8 engine for the Mercury will be produced. The schedule calls for these engines to be in production in time for their inclusion in the '53 model.

Capacity of the plant, when both engines are being made, will be in excess of 4500 units a day.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,688	658,918
March	518,000*	802,737
April		680,281
May		695,898
June		653,682
July		522,858
August		571,442
September		505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161
Week Ended	**1952**	**1951**
Mar. 1	118,397	177,567
Mar. 8	115,126	180,819
Mar. 15	120,392	182,819
Mar. 22	125,347	174,953
Mar. 29	131,191	184,514
April 5	130,000*	158,076

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Another Show Car

If all the "show cars" built by the automotive industry were placed end to end, they'd just about reach from one auto show to the next.

Sister to Chrysler's K-310 was taken off the boat in New York last week. Its body had been built and the car assembled in Ghia's custom shop in Italy where the K-310 was also pounded out. It is called the C-200 and uses the standard Firepower engine.

Packard turned to stylist Richard Arbib and the custom-body building facilities of Henney Motor Co. Inc., Freeport, Ill., for its swank sports creation, called the Pan American. A ground-hugging 36 inches high with top down, the car is built on a regular Packard convertible frame and measures 221 inches over-all. The top, when down, fits into a well behind the front seat and is covered with a metal lid to maintain the sleek rear deck lines. Ornamentation for its own sake is almost entirely missing on this show piece.

Hudson Explains Loss

The rough time Hudson had last year was aired in its financial report, which showed a net loss of $1,125,210 on sales of $186,050,833. During 1950 sales of $267,219,750 resulted in net profit of $12,002,274. Three major causes for the loss were cited by President A. E. Barit: Shortage of sheet steel at mill prices, OPS delay in approval for price increases, and strikes in the company's plants during the greater part of the summer.

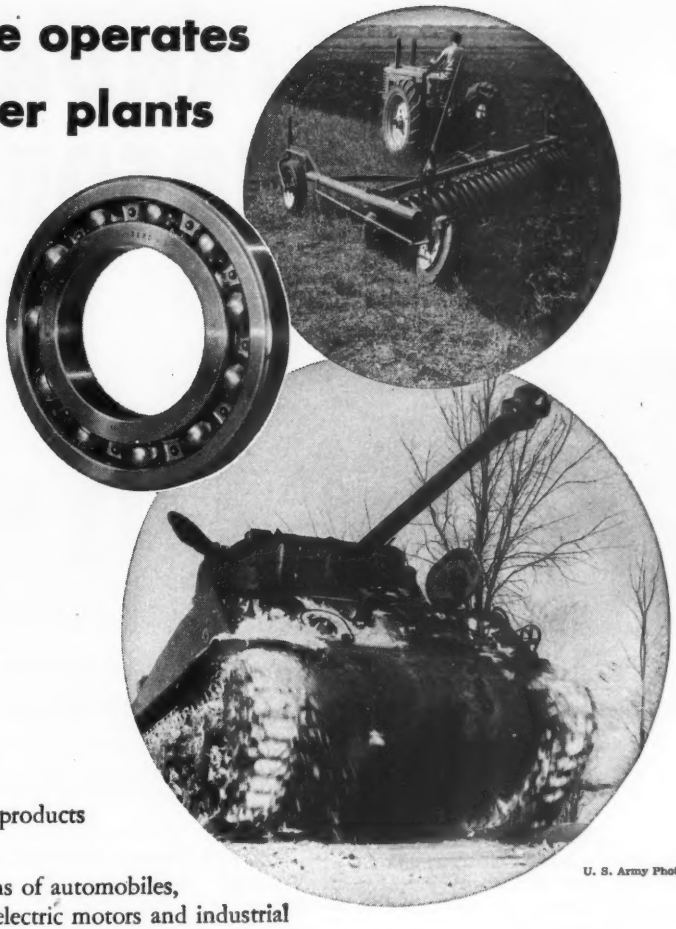
Thus far in 1952, says Mr. Barit, operations again are on a profitable basis.

New Willys Model Arrives

Second of three models of the Aero Willys passenger car line made its debut over the weekend. The Aero "Ace," a deluxe version with its primary distinguishing feature being a wrap-around rear window, will be followed by the "Lark."

Willys-Overland meanwhile is spewing out military jeeps for fair ye well. A new contract for $149 million worth with options to $178 million made the sixth major vehicle contract from Army Ordnance since June, 1949. The new contract will take effect in July.

New Departure operates guns-and-butter plants



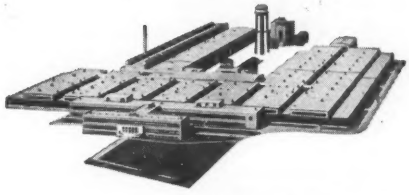
U. S. Army Photo

Ball bearings are essential to the products of our industrial might.

The ball bearings that serve millions of automobiles, trucks, tractors, farm implements, electric motors and industrial machinery are of the same materials, the same heat treatment, the same methods of precision manufacture as those required for mechanized warfare and electronic instruments. Thus conversion from one to the other at New Departure is largely a matter of changing the emphasis on types and sizes.

The productive capacities of the world's largest ball bearing factories are your assurance of the best possible production of your requirements.

New Departure's engineers and vast resources for research are freely at your disposal.



New Departure's plant at Sandusky, Ohio, where ball bearings are produced for *both* industry and the Armed Forces.

NEW DEPARTURE

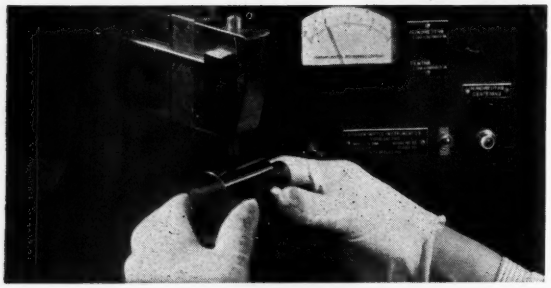
Nothing Rolls Like a Ball... **BALL BEARINGS**

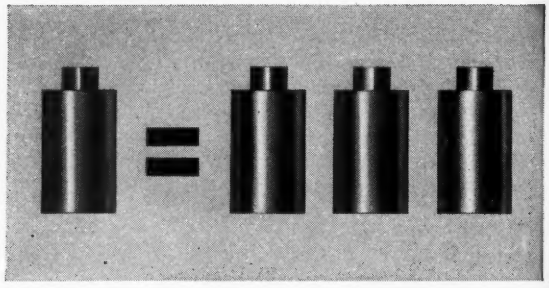
164

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

GRAPH-MO STEEL SETS NEW STANDARDS OF GAGE PERFORMANCE!

Most stable gage steel ever made—outwears others 3 to 1!





12-YEAR STABILITY TEST SHOWS ONLY 10 MILLIONTHS CHANGE IN GRAPH-MO STEEL GAGE

The introduction of Graph-Mo steel to the gage industry has opened the door to new standards of gage performance unattainable with conventional gage steels! New stability! New wearability! New machinability!

Proof of Graph-Mo's outstanding stability is the series of measurements shown below, taken on a typical Graph-Mo steel plug gage. After a period of twelve years this gage measured within ten millionths of an inch of its original dimension.

1940—1.73996	1944—1.73996
1941—1.73995	1945—1.73997
1942—1.73998	1948—1.73997
1943—1.73997	1951—1.73995

REPORTS FROM USERS SHOW GRAPH-MO STEEL OUTWEARS OTHER TOOL STEELS 3 TO 1

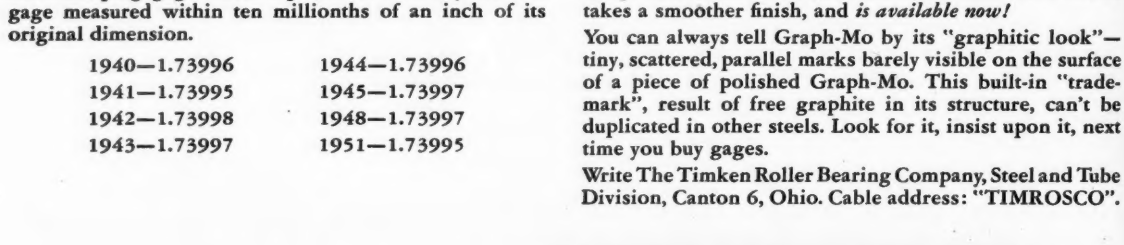
Graph-Mo—a Timken® graphitic tool steel—contains free graphite and diamond-hard carbides. As a result, it has minimum tendency to scuff, or gall, and stubbornly resists wear. Reports from users who have switched to Graph-Mo steel gages show that it outwears other tool steels an average of 3 to 1!

Graph-Mo machines 30% faster than other tool steels, takes a smoother finish, and *is available now!*

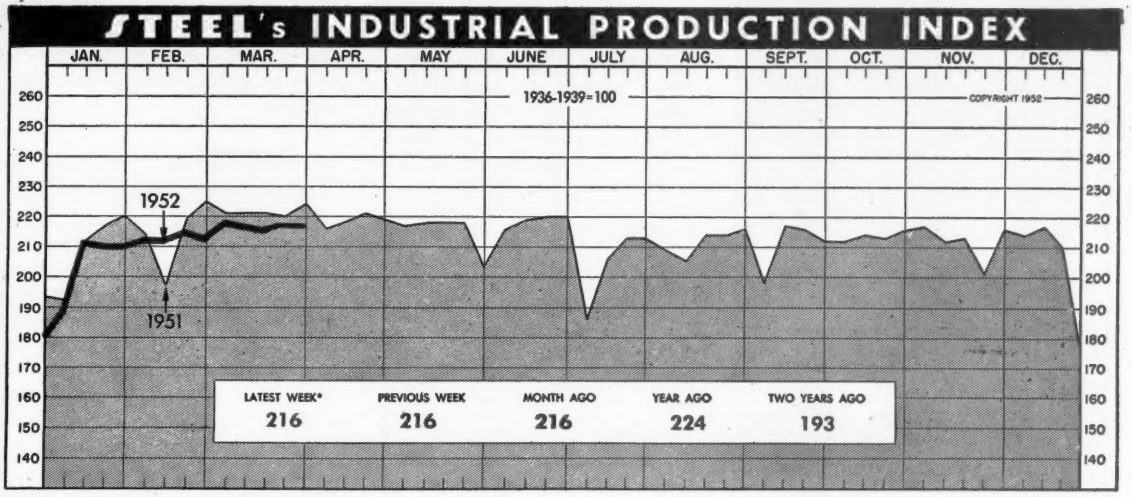
You can always tell Graph-Mo by its "graphitic look"—tiny, scattered, parallel marks barely visible on the surface of a piece of polished Graph-Mo. This built-in "trademark", result of free graphite in its structure, can't be duplicated in other steels. Look for it, insist upon it, next time you buy gages.

Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1936-1939=100
COPYRIGHT 1952
1952
1951
260 250 240 230 220 210 200 190 180 170 160 150 140
LATEST WEEK* 216
PREVIOUS WEEK 216
MONTH AGO 216
YEAR AGO 224
TWO YEARS AGO 193

* Week ended Mar. 29

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

Increased capital outlay for new plant and equipment will help stabilize business this year. Industrial production index maintains its gain

A SOLID foundation for industrial activity is the steady rate of capital outlay for new plant and equipment.

Last year, defense orders bringing increased expenditures on new facilities kept basic industrial production at high levels. This year, increased capital outlay may play an even more significant role in our economy now that metals are easier to obtain and civilian manufacturing is expected to pick up.

American businessmen plan to spend $24.1 billion for new facilities in 1952 (see chart, p. 105), says the Commerce Department and the Securities & Exchange Commission. That will be 4 per cent more than the $23.3 billion spent in 1951, the record year to date.

Following the Trend — Leading the list with the largest increases in expenditures this year are manufacturing industries and electric and gas utilities, with an 8 per cent expected rise. Following the trend of defense spending, manufacturers of durable goods will increase capital outlays by more than 16 per cent. Soft goods producers will spend only 2 per cent more.

Among the manufacturing industries, nonferrous metals companies plan to spend over $500 million in 1952—92 per cent more than in 1951. Electrical machinery, transportation equipment (other than automotive) and rubber industries anticipate spending one-third more. Petroleum and iron and steel companies expect 25 per cent more this year than they did in 1951.

Tapering — Larger companies in particular, says the report, expect higher expenditures this year. Sizeable increases in spending for new facilities are to occur in the first half of 1952, with outlays in the second half slightly below first-half rates.

Index Holds . . .

Reflecting the current improvement in business activity, STEEL's industrial production index in the week ended Mar. 29, remained at the previous week's 216 (1936-1939-100).

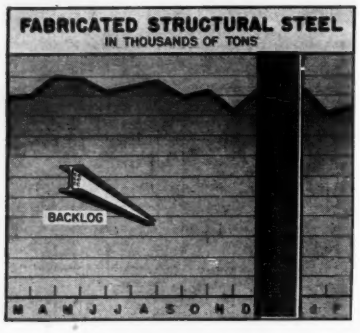
Output Declines . . .

With the resignation of Defense Mobilizer Wilson increasing the threat of an industry strike, steel producers planned the first cutback in four weeks of record-setting activity. American Iron & Steel Institute estimated that 2,120,000 net tons of ingots and steel for castings would be turned out in the week ended Apr. 5. That tonnage marks an 11,000-ton drop from the production of the previous week. Month-ago production reached 2,104,000 tons, and year-ago output was 2,047,000 tons.

Faster Acceleration . . .

Automakers are rolling off production lines as many units as they can and building up stocks for the prospective spring selling season. Only shadow over the increased production schedule is the possibility of a steel strike, with a resulting cutback in steel allocations.

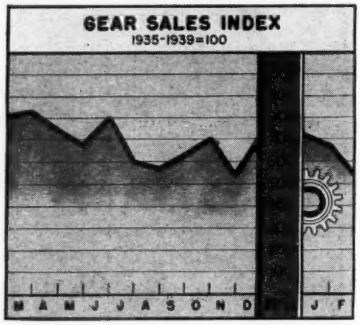
But the easing of production controls and the possibility that they may ease even further are reflected in the industry's increased output. *Ward's Automotive Reports* says that the industry reached a six-month production peak in the week ended Mar. 29. Under present controls, an estimated 1,050,000 cars will be built in the second quarter. If there isn't further easing in controls, carmakers may begin to borrow



Fabricated Structural Steel
Thousands of Net Tons

	Shipments		Backlogs	
	1952	1951	1952	1951
Jan.	242.7	214.0	2,416	2,404
Feb.	248.4	193.6	2,408	2,590
Mar.	....	237.1	....	2,602
Apr.	....	234.1	....	2,808
May	....	234.5	....	2,771
June	....	257.1	....	2,636
July	....	204.4	....	2,688
Aug.	....	236.9	....	2,748
Sept.	....	228.3	....	2,580
Oct.	....	239.0	....	2,641
Nov.	....	218.2	....	2,438
Dec.	....	202.7	....	2,670
Total	....	2,465.8	....	....

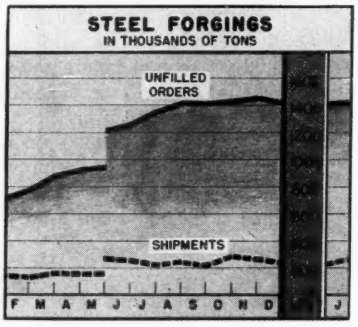
American Institute of Steel Construction



Gear Sales Index
1935—1939=100

	1952	1951	1950
January	670.6	764.6	280.2
February	539.5	809.1	272.9
March	....	830.7	358.4
April	....	742.5	328.6
May	....	667.1	363.1
June	....	800.9	401.0
July	....	589.1	410.7
August	....	564.2	617.4
September	....	630.1	654.5
October	....	703.4	564.8
November	....	530.0	554.9
December	....	716.5	680.4

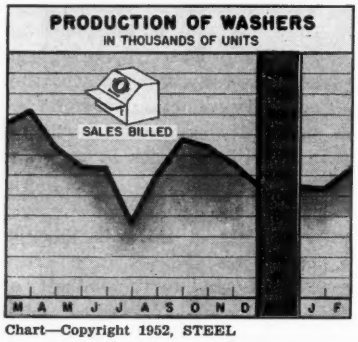
American Gear Mfrs. Association.



Steel Forgings
Thousands of Net Tons

	Shipments		Backlogs	
	1952	1951	1952	1951
Jan.	211*	138	1,421*	709
Feb.	...	129	....	781
Mar.	...	161	....	875
Apr.	...	154	....	924
May	...	266*	....	1,208*
June	...	249*	....	1,264*
July	...	220*	....	1,361*
Aug.	...	240*	....	1,436*
Sept.	...	225*	....	1,419*
Oct.	...	280*	....	1,427*
Nov.	...	256*	....	1,446*
Dec.	...	232*	....	1,411*

U. S. Bureau of the Census. *Data for these months based on reports from commercial and captive forge plants with monthly shipments of 50 tons or more. Previous data based on reports from commercial forge shops producing 3600 tons or more per year.



Household Washers
Sales Billed—Units

	1952	1951	1950
Jan.	213,998	321,092	275,576
Feb.	255,864	341,328	342,967
Mar.	.....	368,455	423,802
Apr.	.....	292,193	333,072
May	.....	253,942	304,640
June	.....	253,119	325,217
July	.....	139,779	282,261
Aug.	.....	239,081	381,452
Sept.	.....	313,756	424,043
Oct.	.....	297,210	439,924
Nov.	.....	262,484	379,964
Dec.	.....	218,664	377,013
Totals	.....	3,301,123	4,289,931

American Home Laundry Mfrs. Assoc.

Chart—Copyright 1952, STEEL

Issue Dates of other FACTS and FIGURES Published by STEEL:

Construction .....Mar 31	Ironers Jan.21	Ranges, Elec. ....Feb. 25
Durable Goods Mar.31	Indus. Production..Feb.18	Ranges, Gas Feb.25
Employ., Metalwkg. Mar.10	Malleable Castings.Mar.17	Refrigerators Feb.25
Employ., Steel Mar.24	Machine Tools Mar.10	Steel Castings Mar.17
Foundry Equip. ...Mar.17	Prices Feb.18	Steel Shipments Dec.17
Freight Cars.....Mar.10	Pumps Mar.31	Vacuum Cleaners ..Mar.24
Furnaces, Indus. ..Mar.31	Purchasing Power...Mar.3	Wages, Metalwkg. .Jan.28
Gray Iron Castings.Mar.17	Radio, TV Mar.24	Water Heaters Mar.24

production metals from third quarter allotments to replenish field stocks.

In the week ended Mar. 29, U. S. and Canadian manufacturers turned out a total of 131,191 cars and trucks, an increase of 5844 units over the previous week's production.

Leveling Off . . .

March production increases in some lines were balanced by declines in others, reports the National Association of Purchasing Agents. Usually about this time, industry experiences a seasonal pickup in production. This year, say buyers, the trends indicate more of a leveling off than a lift.

Prices continued downward, particulary in soft goods, with competition keen for volume business. Many soft spots showed up in industrial price structures, says the association, and others are developing. Manufacturers, holding large stocks in anticipation of defense orders, are liquidating—particularly their soft goods supplies.

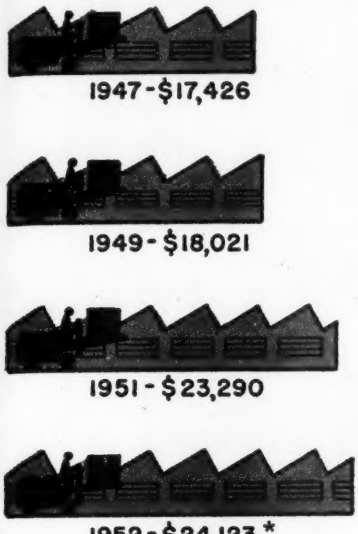
Industrial inventories took a sharp drop in March with lowering price trends and easing materials adding little incentive to lay away supplies. One bright spot is appearing, says the association. That's the tendency to close the gap between declining back orders and rate of production.

Lighter Loads . . .

Less freight will be carried by the railroads during the second quarter of 1952 than in the same period last year. That's the prediction of the Association of American Railroads after receiving estimates from the 13 regional Shippers Advisory Boards. Freight carloadings of the 32 principal commodity groups are estimated at 8,146,723 cars in the second quarter of 1952, 36,902 cars less than the same period last year.

The total of cars loaded in 1952 up to Mar. 22 was at 8,612,644 cars —125,879 cars less than in the same period of 1951. Among the loadings of commodities expected to increase in the second quarter are: Machinery and boilers, 8.8 per cent, and iron and steel, 1.9 per cent. Carloadings of nonferrous

Plant and Equipment
. . . expenditures move upward
(Millions of Dollars)



*Estimated

metals, says the association, are expected to decline by 1.7 per cent during the second quarter.

Plateau Reached . . .

Hourly wages of production workers remained on a high plateau in the three months ending in February. Average pay of the nation's 13 million production workers is estimated at $1.64 an hour by the Labor Department. Although earnings were leveling off, they were 8 cents higher than in January, 1951—when the wage stabilization order was issued.

Workweek of production workers averaged 40.8 hours in mid-February. But postwar peaks for the season were reached in ordnance, machinery, electrical machinery, instruments and fabricated metals industries. Over-the-year workweek declines were reported by the textile, furniture, apparel, paper, chemicals and jewelry industries.

Trends Fore and Aft . . .

Loans to manufacturers of metals and metal products increased by $122 million in the tax-week ending Mar. 19, says the Federal Reserve Board. Those industries received $909 million in loans since Dec. 26, 1951 . . . Work stoppages in February caused 20,000 more man-days idleness than in January. New strikes decreased from 400 in January to 350 in February . . . Wholesale prices declined 0.1 per cent over the week ended Mar. 25, reports the Labor Department . . . February bookings of fabricated structural steel were 202,810 tons.

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	102.0	102.0	103.5
Electric Power Distributed (million kwhr)	7,263[1]	7,354	6,767
Bituminous Coal Output (daily av.—1000 tons)	1,587	1,627	1,698
Petroleum Production (daily av.—1000 bbl)	6,420	6,423	6,041
Construction Volume (ENR—millions)	$271.6	$250.7	$414.9
Automobile, Truck Output (Ward's—units)	131,191	125,347	184,514
TRADE			
Freight Car Loadings (unit—1000 cars)	730[1]	720	755
Business Failures (Dun & Bradstreet, number)	164	181	136
Currency in Circulation (millions)[3]	$28,329	$28,361	$27,038
Dept. Store Sales (changes from year ago)[3]	−10%	−11%	−14%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,091	$19 568	$15,567
Federal Gross Debt (billions)	$258.1	$258.4	$254.9
Bond Volume, NYSE (millions)	$13.5	$12.7	$13.6
Stocks Sales, NYSE (thousands of shares)	6,808	6,356	7,179
Loans and Investments (billions)[4]	$73.9	$73.6	$70.4
United States Gov't. Obligations Held (billions)[4]	$32.0	$31.9	$31.2
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	171.92[1]	171.92[1]	171.92
STEEL's Nonferrous Metal Price Index[6]	243.6	243.6	239.2
All Commodities[7]	111.7	111.8	115.0
All Commodities Other Than Farm and Foods[7]	113.0	113.2	116.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

For Fast Dependable WAREHOUSE SERVICE

Rely on **VIKING**

- COLD FINISHED BARS—Rounds Hexagons, Flats and Squares
- ALLOY COLD FINISHED BARS
- HOT ROLLED BARS—Rounds Flats and Angles
- STRUCTURALS—Channels Angles and Beams
- HOT ROLLED PLATES
- ABRASION RESISTING PLATE
- HOT ROLLED AND COLD ROLLED SHEETS
- HOT ROLLED STRIP
- YOLOY PRODUCTS—Angles Flats, Plate and Sheets
- DEFORMED REINFORCING BARS
- WELDED WIRE MESH
- SOFT BLACK ANNEALED WIRE
- BRIGHT BASIC WIRE AND WIRE RODS
- WIRE ROPE AND FITTINGS

VIKING STEEL COMPANY
16700 St. Clair Ave.
CLEVELAND 10, OHIO

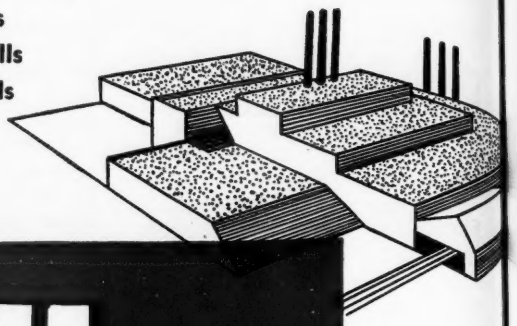
1003 Fisher Bldg., Detroit 2, Mich.

STEPPED-UP QUALITY

Use Ohio Rolls to step up your mill production.
Choose from 11 types of Ohio Iron and Steel Rolls:

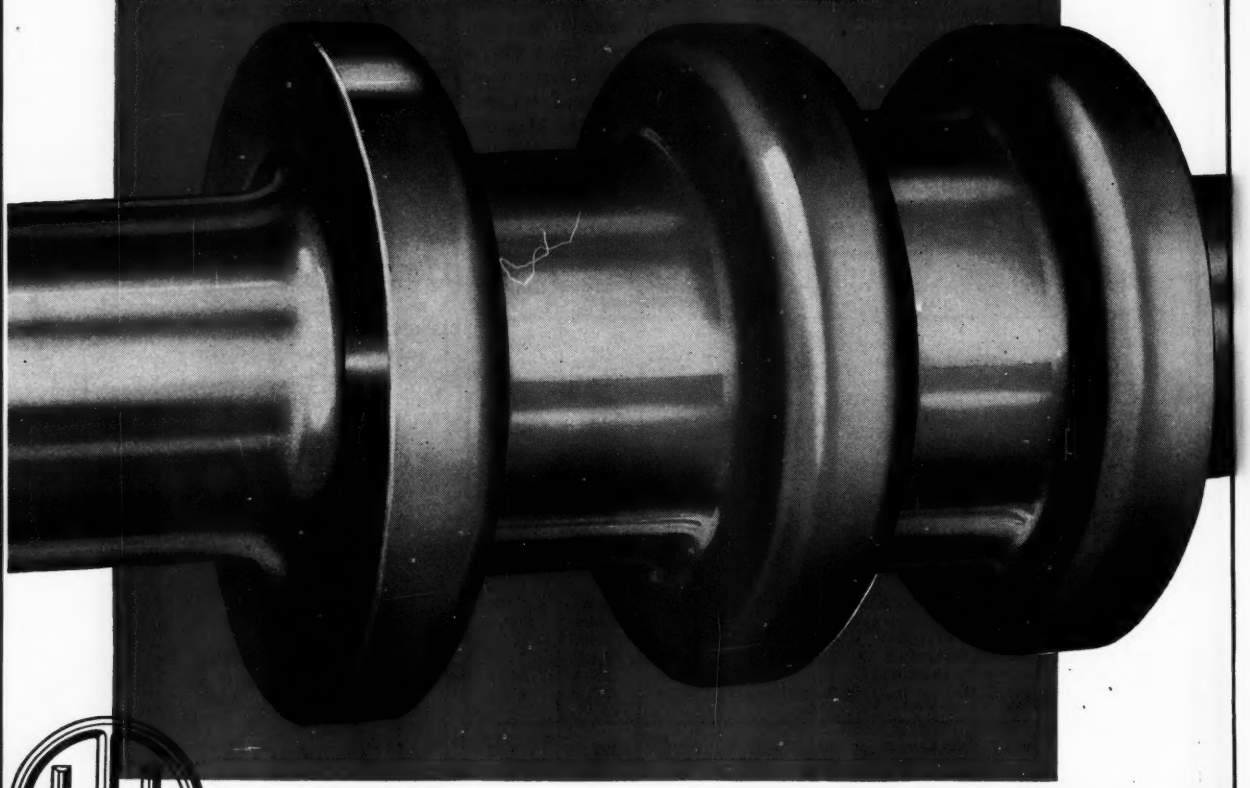
Carbon Steel Rolls	Denso Iron Rolls
Ohioloy Rolls	Nickel Grain Rolls
Ohioloy "K" Rolls	Special Iron Rolls
Holl-O-Cast Rolls	Nioloy Rolls
Chilled Iron Rolls	Flintuff Rolls

Ohio Double – Pour Rolls



Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY



THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO • PLANTS AT LIMA AND SPRINGFIELD, OHIO

Men of Industry

J. E. KIEFER
. . . joins Arms-Franklin Corp.

JUSTICE LOCKWOOD
. . . American Brass V. P.-sales

GEORGE H. GREENE
. . . promoted at Bethlehem's Johnstown plant

Arms-Franklin Corp., Youngstown, appointed **J. E. Kiefer** vice president in charge of sales and engineering, and **J. P. Walsh** in charge of sales promotion. Mr. Kiefer formerly was chief engineer of Stamco Inc., and Mr. Walsh was associated with Lombard Corp. and Wean Engineering Co. Inc. prior to assuming his present position.

Carl L. Hecker, vice president of manufacturing, **Oliver Corp.,** Chicago, since 1949, was elected first vice president of the company.

Chain Belt Co., Milwaukee, appointed **W. J. Sparling** to the newly created position of vice president and manager, Milwaukee operations. **M. G. Jewett** was appointed manager, chain and power transmission division; and **B. F. Devine,** vice president and manager, construction machinery division, becomes a staff officer of the company to serve in an advisory and consulting capacity. **A. K. Thomas** becomes manager, construction machinery.

Detroit Steel Products Co., Detroit, elected **Walter J. Maurer,** production manager, to vice president in charge of production; **J. Lewis Train** to assistant treasurer and controller; and **Howard J. Fichtner** to assistant treasurer and credit manager.

Wallace L. Nahin was appointed sales manager, distillation division, **Cleaver-Brooks Co.,** Milwaukee.

Justice Lockwood, manager of the Buffalo branch of **American Brass Co.,** was appointed vice president in charge of sales for the entire company. He will have headquarters at the company's main office in Waterbury, Conn. The post of vice president, sales has been vacant since retirement of **Elton S. Wayland** on Jan. 1, 1950.

Sheldrick Mfg. Co., Upper Sandusky, O., elected **Paul Donham** to the newly created position of executive vice president and general manager in charge of manufacturing and sales. Mr. Donham also continues his management consulting practice in Toledo, O. **G. E. Sheldrick Jr.,** president and treasurer, will be responsible for a program of long-range product development and diversification. **C. A. Kruse** was made works manager.

Russell H. Randolph was appointed general sales director of **Fageol Heat Machine Co.,** Detroit.

Robert V. Eldridge was elected secretary, **National Motor Bearing Co. Inc.,** Redwood City, Calif. He formerly was with Columbia Steel Co., now Columbia-Geneva Division of U. S. Steel Co.

L. R. Foote was promoted to national sales representative for industrial combustion equipment designed and manufactured by **Bryant Heater Division,** Affiliated Gas Equipment Inc. He continues his New York area office in Yonkers.

George H. Greene, chief engineer of **Bethlehem Steel Co.'s** plant at Johnstown, Pa., was appointed assistant general manager. He is succeeded by **Allen N. Reynolds Jr.,** engineer of construction at Johnstown since 1950. **W. D. MacDonnell** also serves as assistant general manager of the plant, a position he has held since 1949.

Richard S. Jones, formerly a sales representative, was named manager of stainless steel sales for **A. B. Murray Co. Inc.** at its McKeesport, Pa., plant. **C. J. Rice** succeeds Mr. Jones as sales representative covering central and western Pennsylvania. **James C. Finley** was made sales representative in the western New York area.

Arthur H. Nelson was made manager of electric tool sales in the Chicago branch of **Independent Pneumatic Tool Co.**

George D. Stroman was promoted to assistant to the superintendent, miscellaneous finishing department of **Lukens Steel Co.,** Coatesville, Pa.

Leckenby Structural Steel Co., Seattle, appointed **Wallace A. Lagerquist** vice president and works manager, **Rex Ruston** as secretary and contract manager, and **Frank Hodge** as special representative for Stansteel.

Norman C. Halleck was appointed to the newly created position of assistant to general superintendent

in charge of cost control at the Gary, Ind., Works of **United States Steel Co.** He is succeeded as assistant plant industrial engineer by **Grove R. Ginder.**

Basic Refractories Inc., Cleveland, appointed **Mathew J. Ludwig** vice president-controller, and **Theodore Thomas,** assistant controller.

Alex G. Pappas joined **Curtis Mfg. Co.,** St. Louis, maker of air conditioning and refrigeration equipment, as advertising manager.

Robert B. Hicks was appointed manager, commercial aircraft division, **Pacific Airmotive Corp.,** Burbank, Calif.

Franklin V. Varner was named plant industrial engineer of **U. S. Steel Co.'s** Clairton, Pa., Works. He was general supervisor in charge of methods at U. S. Steel's McDonald, O., mills. At the Ohio Works, Youngstown, **J. David Carr** was named assistant plant industrial engineer to replace **David H. Everest,** recently named plant industrial engineer. **R. D. Griffith** was named general supervisor of methods for the Youngstown district plants, and **Richard Ostheimer** was named general supervisor in charge of incentives.

Lockheed Aircraft Corp., Burbank, Calif., appointed **Neil D. Smith** to co-ordinate community development at its new Palmdale jet test center.

Sauereisen Cements Co., Pittsburgh, manufacturer of technical cements and bonding compounds, appointed **George J. Chandler** sales engineer.

CHARLES E. WALKER
. . . new V. P. at Vulcan Mold & Iron

HOWARD J. DAVIS
. . . assists president at CF&I

Vulcan Mold & Iron Co., Latrobe, Pa., created a new executive position of vice president of engineering and operations, and named **Charles E. Walker** to the post. Mr. Walker formerly was manager, engineering and production.

Nottingham Steel Co. appointed **Charles W. Zerler** western district sales manager, with offices in the Chicago warehouse.

Willard M. Broxham was named vice president in charge of sales, **Graver Tank & Mfg. Co. Inc.,** East Chicago, Ind. He has been associated with the company for more than 30 years; since 1950 he has been manager of sales for all divisions.

Link-Belt Co., Chicago, elected **Robert C. Becherer** president to succeed **George P. Torrence,** retired. Mr. Becherer, who joined the company in 1923, was elected vice president in 1951 and later in the year was appointed executive vice president.

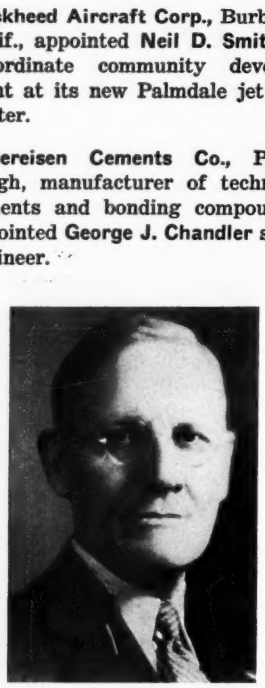
Howard J. Davis was appointed assistant to the president, **Colorado Fuel & Iron Corp.** He joined the corporation in 1940 to establish a welded wire fabric division. Following development of that department, he became manager of product research and development and subsequently manager, wire product sales. Early in 1950 he was assigned as an assistant on the executive staff. Mr. Davis continues headquarters at the Denver office.

Charles R. Crowder, vice president and general manager, **Van Norman Co.,** Springfield, Mass., was elected first vice president and a member of the board. Elected vice presidents are **T. W. Baush,** general export manager of the subsidiary, Morse Twist Drill & Machine Co., and **George H. Dickinson,** sales manager, automotive division.

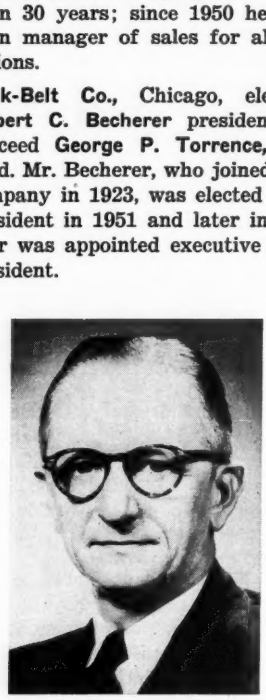
James J. Edwards was appointed works manager of the new **General Motors Corp.'s** dual purpose plant at Arlington, Tex. **John T. Quill** was made director of purchases, **George Marzonie** plant engineer, **Donald C. Stewart** master mechanic and **Robert T. Weiser** personnel director.

Trailmobile Inc., Cincinnati, appointed **Paul W. Heasley,** comptroller, as vice president-comptroller, and **Lloyd R. Everhard,** secretary, as secretary-treasurer of the company.

J. H. Cristil Co., Edgerton, O., appointed **John Farran** chemical engineer, responsible for quality control in the company's impregnat-



GEORGE J. CHANDLER
. . . sales engineer at Sauereisen Cements



ROBERT C. BECHERER
. . . new president of Link-Belt

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Furnishing tubing that speeds a customer's production processes is a Superior specialty.

A case in point is illustrated above. The customer, New Hampshire Ball Bearings, Inc., manufactures high-speed, precision ball bearings. They formerly machined the races for certain of their smaller sized bearings from solid stock. This represented a considerable material loss . . . and a substantial time loss in the manufacturing process.

Prime requirements for the races were concentricity within 10% of the race wall thickness, dimensional tolerances under .002" and hardness. After consultation with us the customer began to fabricate these races from 52100 Alloy Steel tubing. Time, material and money were saved and the product improved.

Such savings are almost a commonplace with Superior customers. Because of our long experience in standard production of what is generally regarded as specialty tubing, we can frequently supply a quick and easy solution to the most difficult problems . . . and generally do so without charging "premium" or special handling prices.

If you have a need for fine small tubing in any analyses . . . almost any shape . . . and of a superior quality . . . it will pay you to check with us. We may be able to fill your needs from stocks of our selected distributors in key cities. Write Superior Tube Company, 2005 Germantown Ave., Norristown, Penna.

BE SURE ABOUT TUBING— SPECIFY *Superior*

THE BIG NAME IN SMALL TUBING

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Certain analyses (.035" max. wall) up to 1⅜" O.D.

ROUND AND SHAPED TUBING

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ing, anodizing and specialized painting and finishing departments.

George N. Goad was elected vice president of the Canadian subsidiary of **Standard Railway Equipment Mfg. Co.** His offices are in Montreal.

E. Colin Forbes and **Thomas R. McNeill** were transferred from the Niagara Falls, N. Y., plant of **Electro Metallurgical Co.**, division of Union Carbide & Carbon Corp., to assume production posts at Electromet's new ferroalloy plant on the Ohio river.

John J. Radigan Jr. is the newly appointed vice president, industrial relations at **P. R. Mallory & Co. Inc.**, Indianapolis.

Marshall N. Austin was appointed manager of the Columbus, O., sales office, **Westinghouse Electric Corp.**

Leo P. Sinclair, formerly with the Navy Department, was appointed field engineer for **Daco Machine & Tool Co.**, Brooklyn, N. Y.

Robert Carbary, former sales manager, truck division, was made assistant to the executive vice president of **Holley Carburetor Co.**, Detroit. He is replaced by **B. R. Tabbert.**

H. M. Reeser, vice president-secretary, and **D. M. Horner**, vice president, were elected to the board of directors of **Harrisburg Steel Corp.**, Harrisburg, Pa.

JOSEPH J. THOMAS
. . . asst. sales-mgr., N. American Refractories

Joseph J. Thomas was appointed assistant sales manager, **North American Refractories Co.**, Cleveland. He formerly was district sales representative in the Chicago and Cleveland offices.

Edgar Washburn, vice president, **Hayes Mfg. Corp.**, Grand Rapids, Mich., was made a director.

Winder Aircraft Corp., Winder, Ga., appointed **W. Henderson Cotter** sales manager, parts division.

Paul S. Lane and **Merrill D. Stanley** were named vice presidents of **Muskegon Piston Ring Co.**, Muskegon, Mich.

R. A. Bowman was appointed plant manager, Berry Division, **Oliver Iron & Steel Corp.**, Pittsburgh. He succeeds **Martin L. Killgallon**, resigned.

C. H. SCHWERIN
. . . George J. Hagan Co. sales mgr.

George J. Hagan Co., Pittsburgh, appointed **C. H. Schwerin** manager of sales and sales engineering. He has been with the company since 1935.

Harry P. Davison was elected a director of **United States Steel Corp.**, New York, and a member of its finance committee to succeed the late **William A. Irvin.** Mr. Davison has been a vice president and director of J. P. Morgan & Co. Inc. since its incorporation in 1940.

Appointments in General Electric Co.'s newly formed industry control department in Schenectady, N. Y., include: **Joseph T. Bailey**, named manager of marketing; **F. Wiley Hubbell**, manager of finance; **W. F. Oswalt**, manager of manufacturing; and **H. W. Poole**, manager of engineering.

OBITUARIES . . .

R. Robert Smith, 53, president of **Milwaukee Forge & Machine Co.**, Milwaukee, died Mar. 30 of a heart attack. He joined the company as vice president in 1929, and become president in 1932.

Lucian E. Kinn, 65, president and general manager, **Seneca Wire & Mfg. Co.**, Fostoria, O., died Mar. 25 in New Orleans.

W. D. Keefe, 54, manufacturers' agent and former sales manager, refrigeration division, **Fedders Mfg. Co.**, Buffalo, now known as Fedders-Quigan Corp., died Mar. 25 of a heart attack.

John G. Munson, 67, former vice president in charge of raw materials of **United States Steel Corp.** of Delaware, died Mar. 29 in Pittsburgh. He served for 31 years with U. S. Steel, and retired in 1950.

Sir Andrew Duncan, 67, chairman of **Great Britain's Iron & Steel Federation**, died Mar. 30.

Harry T. Woolson, 75, retired executive engineer, **Chrysler Corp.** and former president, Chrysler Institute of Engineering, died Mar. 23 in St. Petersburg, Fla., where he was vacationing.

Lawrence E. Green, 55, chairman of the board of **Cleveland Pneumatic Tool Co.**, died Mar. 27 in his office at Boston.

Linn M. Rakestraw, 60, manager, marine department, **Foster Wheeler Corp.**, New York, died Mar. 23 after a brief illness.

Francis F. Gregory, merchandising co-ordinator, **A. O. Smith Corp.**, Milwaukee, died Mar. 8.

Arnold C. Hackstaff, 57, manager of the Denver district sales office, **Youngstown Sheet & Tube Co.**, died recently.

Roy Wellman, 46, production manager, **Dings Magnetic Separator Co.**, Milwaukee, died Mar. 26.

Elmer Pilgrim, 66, engineer expediter, **Kearney & Trecker Corp.**, Milwaukee, died Mar. 28.

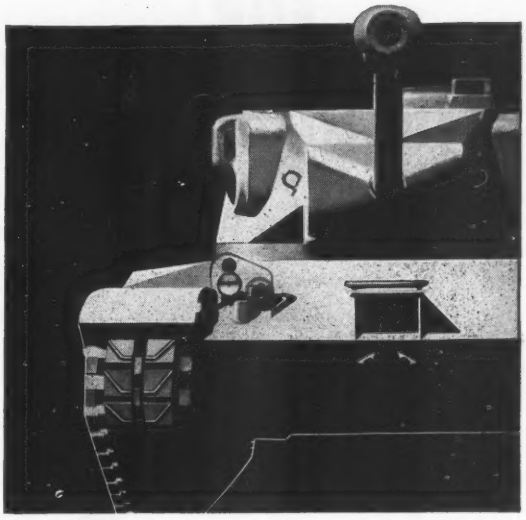
Robert F. Wormley, 49, manager of engineers' products division, **Grinnell Co. of Canada Ltd.**, died Mar. 27 in Toronto.

HOT Lacquer NEWS

PUBLISHED PERIODICALLY BY HERCULES POWDER COMPANY IN THE INTERESTS OF BETTER FINISHES AND FINISHING

New Ford Plant to Use Hot Lacquer For Finishing Army Tanks

Hot-Spray Process Avoids Installation of Baking Ovens in Ford's Livonia, Mich., Assembly Plant



The decision of Ford's Tank Division to use hot-spray lacquer exclusively for finishing tanks at its new Livonia, Michigan, plant points up, once again, the advantages offered by this time-saving and money-saving process. This fast-drying system, developed by The Ordnance Corp, includes a new nitrocellulose base primer, MIL-P-11414 (ORD).

The enthusiastic switch to hot lacquer in defense and other industries stems from the following reasons:

- finishing time is cut by as much as 50%
- expensive baking equipment is unnecessary
- Every pass of the spray gun assures more solids . . . greater thickness
- fewer coats are needed
- less solvent is used
- coverage per gallon is increased
- finish has better flowout
- blushing is eliminated

HERCULES POWDER COMPANY
INCORPORATED

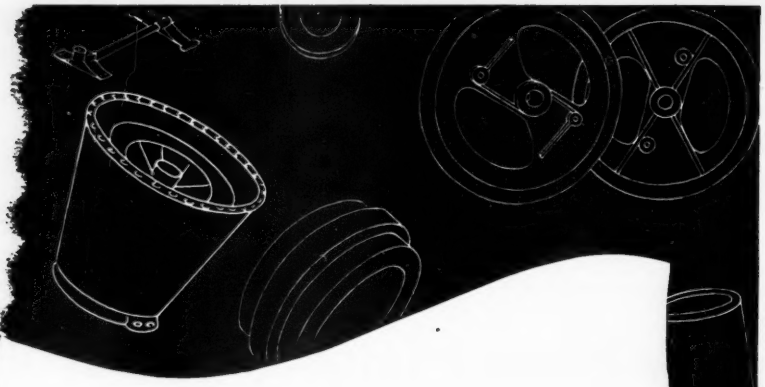
Cellulose Products Department
930 King Street, Wilmington 99, Delaware

You'll want to read about the broader uses of lacquer for finishing defense items—and your own products. New military specifications for lacquer and primer are now issued and official. Identified as "Military Specification MIL-L-11195 (ORD) Lacquer, Lustreless, Hot-Spray (For Ammunition)" and "MIL-P Primer, Lacquer, rust inhibiting." Hercules will send you full information on hot lacquer, types of heating equipment available, and the performance record of hot lacquer in many industries. Send for it today.

CL52-2

HERCULES DOES NOT MANUFACTURE LACQUERS OR HOT LACQUER EQUIPMENT, ONLY THE INGREDIENTS FROM WHICH LACQUERS ARE MADE

GO "AMERICAN" FOR CIRCULAR WELDED PRODUCTS



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Production AND Engineering
NEWS AT A GLANCE

MOVE OVER, ACCOUNTANTS—Potential applications of electronic computers and instrumentation to industrial problems are almost limitless. Research at Battelle Memorial Institute indicates that within the next few years, large data-processing systems now under development will take their places in accounting systems to provide management with up-to-date cost information. Typical of small data-processing systems are statistical quality-control computors. These systems perform all the calculations required for statistical control of product qual.ty.

60-CYCLE HEATING—Sixty-cycle induction heating appears to have a bright future, if current rate of installations in the nonferrous field keeps up. One induction unit heats 6000 pounds of aluminum per hour, to 850°F, at an average output of 750 kw. It handles 9 and 11-inch diameter billets, 36 inches long. This means one 9-inch billet every 2½ minutes. p. 118

PROVING GROUND SCRAP—At Aberdeen Proving Ground, the Army is cutting up captured enemy tanks and other foreign weapons, as well as obsolete and worn-out U. S. military items. Three thousand tons of scrap has been shipped so far. The project should produce a total of 5000 tons. The Navy reports that since 1948 10,000 tons of lead was salvaged, and since 1951, 7,487,501 pounds of copper and copper-base alloy.

ON BERYLLIUM TOXICITY—Beryllium and beryllium compounds are extremely poisonous to some people, particularly attacking the lungs. Armour Research Foundation points out the importance of taking precautions to prevent the build-up of beryllium-containing particles in the air. Melting, machining and general handling can be dangerous without adequate ventilation. The Atomic Energy Commission is an excellent source for the latest information on this subject.

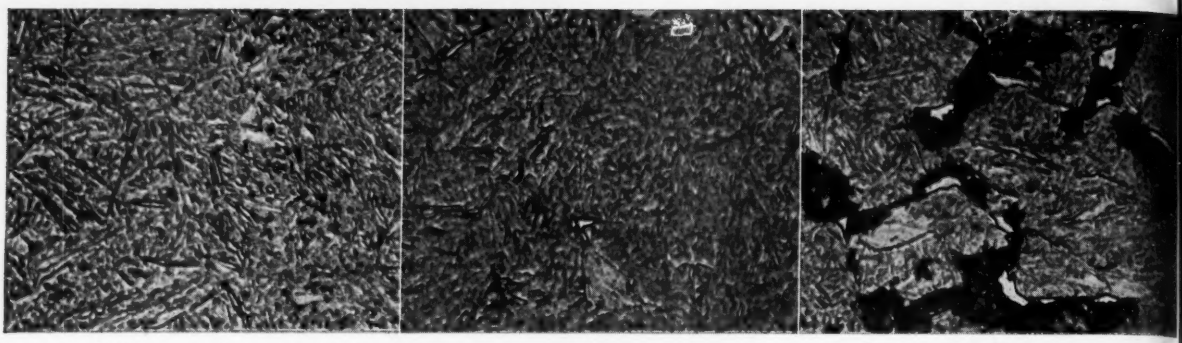
QUARTZ FOR ASBESTOS—Quartz paper that may be substituted for asbestos insulation paper—that's the Naval Research Laboratory's youngest brain child. The new paper can be manufactured cheaply from abundant domestic sources. It is made from laboratory-produced fibers, identical chemically with natural quartz. Two types of fibers are made into paper: Hydrous and anhydrous. Paper made from the anhydrous fiber is expected to be used widely as an electrical insulating material where resistance to high temperature and low electrical losses at high frequencies is required. The magnetite-free quartz paper will withstand temperatures up to 3000°F, as compared with an upper limit of about 1000°F for asbestos.

DEFIES CORROSION—High temperature and corrosion resistance of porcelain enamel coatings is being put to good use in the protection of nonstrategic steels in services usually requiring noncorrosive metals. In the aeronautical field, porcelain enamel coating is used extensively for jet motor and rocket components. Some applications under study involve temperatures up to 3500°F. p. 116

ATOMIC INTIMATIONS—American Can Co. is investigating use of radioisotopes in tracing complicated chemical and biological processes. Studies with the radiation-emitting atoms will include food sterilization, measurement of metal thickness and organic coatings, and the curing of rubber and enamel . . . Stanford University's new radiation engineering laboratory will use a 5000-curie source of Cobalt 60, a gamma ray emitter. By curie measurement (rate of atomic disintegrations per second), emissions from a 5000-curie source are so powerfully penetrating that they could be only partly duplicated by about $100 million worth of radium.

SILICON UP, ROCKWELL DOWN—During investigations of several heats of a silicon-chrome type valve steel, Timken metallurgists observed that the higher silicon contents tended to decrease rather than to increase the steel's hardenability. They checked further and discovered that in the steels tested hardenability actually dropped from 2.35 to 4.92 per cent even though silicon content was higher. This anomalous behavior, they found, is due to a faster critical reaction rate rather than to graphitization. Significance of the studies: Closer control of hardenability and a better understanding of quenching reactions. p. 114

IGNITRON RECTIFIER LOCOMOTIVE—A revival of interest in railroad electrification may result from a Westinghouse development, the Ignitron rectifier locomotive. The revolutionary locomotive is so powerful that it recently hauled 1¼-mile long train of 162 fully-loaded coal cars. Ignitron rectifier tubes convert alternating current from overhead trolley lines to direct current for driving the locomotive's motors. While alternating current is easier and cheaper to transmit, direct driving motors have many operation and cost advantages. The 6000-hp, two-unit locomotive is 124 feet long, on six motored axles. It weighs 740,900 pounds and can pull 189,000 pounds.



Distances from quench end: 1/16-inch ..... 7/32-inch ..... 7/16-inch .....

Micrographs illustrating changes in microstructure in the Jominy bar from heat D, 4.92 per cent silicon. Specimens quenched from 1950° F. 1000X

Closer Hardenability Control For Silicon-Ch

Studies of silicon-chromium valve steel reveal that, contrary to expectations, hardenability decreases as silicon content increases. This is result of faster critical reaction rate

By B. C. SCHOTT and S. ISENBERG
Metallurgists
Timken Roller Bearing Co.
Steel & Tube Division
Canton, O.

CLOSER hardenability control and better understanding of the reaction that occurs during the quenching of high silicon steels may result from an investigation completed recently at Timken. Major finding: In silicon-chromium valve steel, hardenability decreases as silicon content increases from 2.35 to 4.92 per cent.

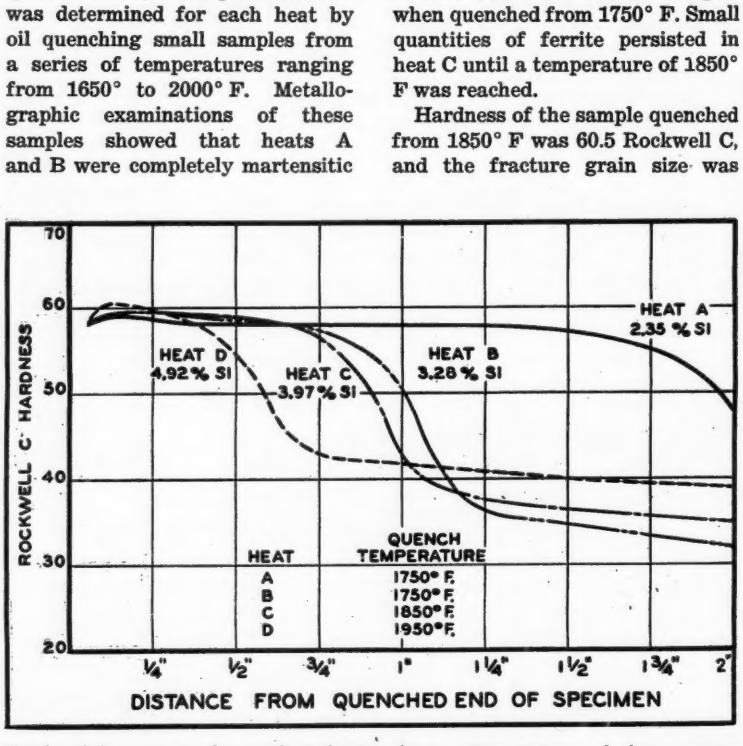
Metallographic studies establish the fact that the decrease in hardenability with increasing silicon content is due to a faster critical reaction rate rather than graphitization. The higher silicon contents are conducive to ferrite formation during quenching which is responsible for the formation of intermediate transformation products.

This anomalous behavior of silicon can be observed by comparing the chemistries of the production heats, Table I, with their corresponding Jominy hardenability values shown in Table II. These data show that the lowest silicon heat (18031) gave the highest hardenability.

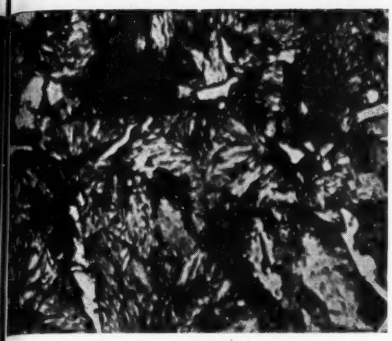
Experimental Heats—Four 30-pound induction heats in which the carbon, manganese, and residual elements were held fairly constant, were melted; silicon aim varied within the range of approximately 2.00 to 5.00 per cent.

Austenitizing temperature required to attain complete solution was determined for each heat by oil quenching small samples from a series of temperatures ranging from 1650° to 2000° F. Metallographic examinations of these samples showed that heats A and B were completely martensitic when quenched from 1700° F. A maximum hardness of 60.5 Rockwell C and a fracture grain size of 8 were obtained on both samples when quenched from 1750° F. Small quantities of ferrite persisted in heat C until a temperature of 1850° F was reached.

Hardness of the sample quenched from 1850° F was 60.5 Rockwell C, and the fracture grain size was



Hardenability curves for each induction heat. Comparison of these curves shows that the hardenability decreases with increasing silicon content



1 inch

Chromium Steel

8. Ferrite persisted in heat D until a temperature of 1950° F was reached, and the as-quenched hardness of a sample quenched from 1950° F was 61 Rockwell C. Fracture grain size was 7½. Based on the microscopic examinations together with hardness and fracture grain size determinations, temperatures shown in Table III were selected for end quench hardenability tests.

Hardenability Results — Jominy hardenability specimens were end-quenched by standard procedure. The ground flats on the Jominy bars were polished, nital etched and examined microscopically. Bars representing heat A and heat B were completely martensitic to distances of ⅞-inch and 9/16-inch from the quenched end respectively, at which point the first traces of intermediate transformation product appeared. The intermediate transformation product formed at random locations progressing along the remainder of the bar. Bars representing heat C and heat D were completely martensitic to distances of ⅜-inch and 3/16-inch from the quenched end respectively, at which point traces of proeutectoid ferrite were observed. In both heats traces of intermediate transformation product were observed around the small ferrite grains a short distance from the point of initial ferrite precipitation. Proceeding farther along the bars, it could be seen that the ferrite had precipitated at the austenitic grain boundaries with intermediate transformation product around the ferritic grains.

It appears probable that the intermediate transformation product was nucleated by the ferritic grains; this might offer an explanation for the reverse hardenability effect that occurred. No graphitization was observed in any of the bars.

TABLE I
CHEMISTRY OF PRODUCTION HEATS

Heat Number	C	Mn	P	S	Si	Cr	Ni	Mo
18031	.37	.30	.018	.012	3.33	2.19	.25	.03
18292	.39	.32	.011	.015	3.89	2.10	.20	.02
18293	.39	.22	.011	.014	3.82	2.14	.14	.03
18294	.37	.25	.011	.013	3.86	2.23	.15	.04
23904	.40	.18	.010	.013	3.94	2.00	.11	.02
23941	.38	.23	.013	.018	4.05	2.15	.11	.03
23942	.41	.22	.011	.015	3.92	2.16	.10	.02
23944	.39	.20	.014	.011	4.04	2.13	.12	.02

TABLE II
Distance from the Quenched End in Sixteenths of an Inch

Heat Number	J-55	J-50	J-45
18031	3½	7¾	10
18292	3¾	6¼	8
18293	2	5¼	7¼
18294	...	4	6½
23904	4¼	5¾	6½
23941	3½	5½	6½
23942	5	6¼	7¼
23944	3¼	5½	6¾

TABLE III
ANALYSES OF INDUCTION HEATS

Heat Code Number	Chemical Analysis C	Mn	Si	Cr	Ni	Mo	End-Quench Temperature
A	.41	.33	2.35	2.33	.31	.03	1750° F
B	.39	.34	3.28	2.25	.42	.03	1750° F
C	.41	.31	3.97	2.42	.44	.02	1850° F
D	.41	.34	4.92	2.26	.37	.06	1950° F

Air Locks Cut Atom Risk

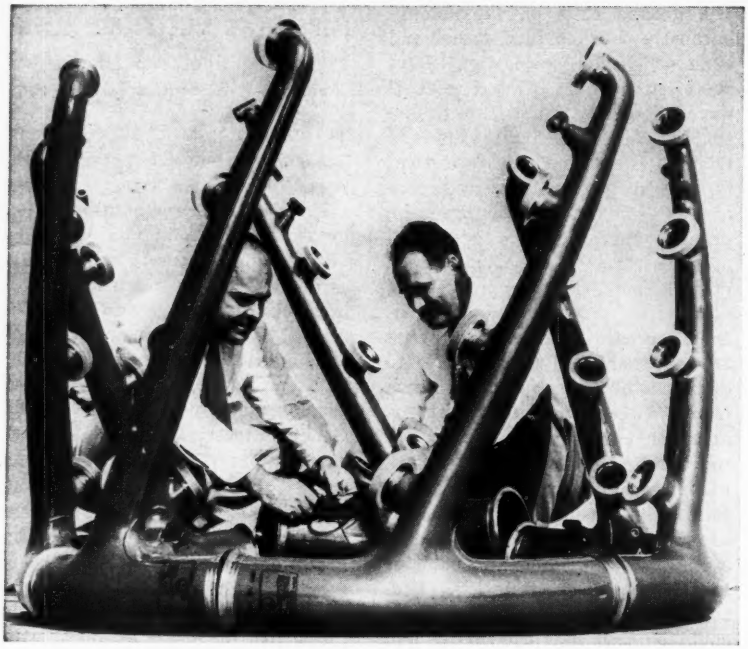
Plant design can check hot radioactive materials by controlling air flow

Air locks between hot and cold pressurized zones protect personnel against airborne contamination in atomic plants and laboratories. Measures necessary to provide this protection when materials are produced by nuclear fission were described to the American Society of Mechanical Engineers at their annual spring meeting, University of Washington, by W. W. McIntosh, General Electric Co.

Handling radioactive materials that poison on entrance into the body creates a different problem from that resulting in damage by radiation, says Mr. McIntosh. The former would be relatively simple except for the extremely toxic properties of many of these substances — some more poisonous than any previously known. So all possible care must be taken in original design to limit spread of contamination.

One method Mr. McIntosh recommends is to establish controlled differential air pressures between areas of different degrees of hazard. Uncontaminated areas are usually termed cold; zones of greater risk are called hot. These varied hazard levels are completely separated structurally. Access between zones is gained through air locks. Within each zone, air is supplied to areas of least risk and exhausted principally from equipment, hoods or other areas of highest risk. Ventilation balance within the zone is such that flow through the doorways is always toward the more hazardous side. Air locks are not ventilated, but when doors are opened toward the hot side, air will leave the air lock toward the zone of lower pressure.

Modulating damper is provided in the exhaust system to maintain constant exhaust pressure. This holds quantity of air exhausted at constant value. Under the zone pressure ventilating system, maintenance of design pressure differential between zones depends on operation of the dampers. If they fail, alarms sound to warn of the resulting differential loss.



Porcelain enameled exhaust manifold with a protective coating on a nonstrategic alloy metal base, is used on Pratt & Whitney R-4360 engine, 3500 hp

Possibilities In Porcelain Enamel—

Coated Steels Conserve Scarce Alloys

Porcelain enamel researchers report coatings have high resistance to temperature, corrosion, thermal shock, severe abrasion and a low coefficient of friction

By EDWARD MACKASEK
Managing Editor
Porcelain Enamel Institute
Pittsburgh

FAMILIAR porcelain enamel, found in every bathroom and kitchen may be an important solution to critical metal supply problems in the defense program. In a number of applications porcelain enamel-coated steels have been developed which possess all necessary service characteristics of stainless steels and other alloys. Because of porcelain enamel's noncorrosive nature, same solution may be developed for certain copper, brass and bronze applications.

In replacements already developed or under study, stainless steel or high grade alloy originally was specified for resistance to high temperatures, corrosion or thermal shock often combined with abrasion. Porcelain enamel is actually a form of boro-silicate glass fused to steel and is favorable for such uses. It offers a low coefficient of friction and a degree of hardness that resists severe abrasion.

High Temperature Applications—As early as 1943, a porcelain enamel coating to protect mild steel at temperatures up to 1250°F was developed, and used during World War II for such applications as aircraft exhaust stacks and exhaust pipes for amphibious trucks. Most recently, work along this line has been concentrated in the aeronautical field, where exhaust temperatures have increased. Engines generate 3000 hp or more and temperature of gases in the headers often exceeds 1900°F.

Under such circumstances, the problem of substituting for critical materials involves a protective coating, and a high heat-resistant but nonstrategic alloy metal base. For quite some time, Pan American World Airways has been conducting service tests with porcelain enameled headers made of 19-9DL steel, an alloy containing nickel, chromium, tantalum, titanium, tungsten, columbium and molybdenum.

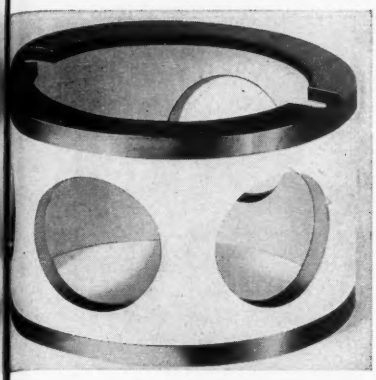
After 1234 hours of operation, laboratory examination revealed coating had offered complete protection against both heat and corrosive gases. Pan American's entire fleet of Boeing 377 Stratocruisers is being equipped with porcelain enameled exhaust headers.

Significant in the aeronautical field is use of porcelain enamel coating for components of jet motors and rockets. At the Enameled Metals Section of the U. S. Bureau of Standards, some applications under study involve temperatures as high as 3500° F. Complete details cannot yet be divulged, but the results are said to be extremely encouraging.

Corrosion - Resistance — Porcelain enamel is used as a substitute for noncorrosive metals such as stainless steel at B. F. Goodrich Chemical Co., Port Neches, Tex. The porcelain enamel application reported is for stripping column trays used in synthetic rubber processing. According to company, porcelain enameled trays are cleaned with a minimum of labor because latex does not adhere to glass-smooth surface, and are reported to be a worthy substitute for polished noncorrosive metals.

Resists Thermal Shock—Service condition — for which porcelain enamel has proved effective is thermal shock. Coefficient of expansion of porcelain enamel is nearly identical with the metal base. Metals will withstand rapid changes in temperature.

An example is use of porcelain enamel as a protective coating for submarine exhaust mufflers. In service, porcelain enamel with-



Fuel selector valve, when porcelain enameled must withstand 10,000 cycles of dry operation, must resist abrasion of sand and grit and the corrosive additives of high octane fuel

stands effect of high temperature exhaust gases and instant submersion in icy seas. It also provides protection against the corrosiveness of exhaust gases and ocean brine.

Aircraft Applications—A manufacturer of aircraft components was confronted with Air Force specifications on a fuel selector valve requiring that the valve withstand 10,000 cycles of operation without lubricant. Valve had to resist abrasion possible through the introduction of sand or grit and the corrosive additives of high octane fuel. Plenty of metals could provide the abrasion and corrosion resistance required, but none would stand up under the grueling dry run without scoring or galling. Problem was solved by porcelain enameling the plug or seating portion of the valve. Manufacturer, Aero Supply Co., states some of these valves have been in operation for five years without maintenance.

Dimensional specifications on valve plug call for accuracy to plus 0.001-inch and minus zero. This is accomplished by grinding and lapping the porcelain enamel—an operation not usually considered in designing for porcelain enamel finishing.

Washer-Tumbler Speeds Cleaning, Deburring

SCREW MACHINE products of Buick Motor Division, General Motors Corp., Flint, Mich., get the benefit of a special kerosene washer built to Buick's design. Unit is a combined washer and tumbling barrel whose perforated steel drum is 40 inches in diameter. It rotates at 8 rpm and has interior cleats of ¼-inch bars that help tumbling action.

In the base tank of the machine are 150 gallons of kerosene to a level 9 inches above the bottom of the drum. Parts are constantly washed as they are carried through this bath. Tumbling results in removal of burrs and teats and produces some scouring action. Rust accumulated on parts is removed.

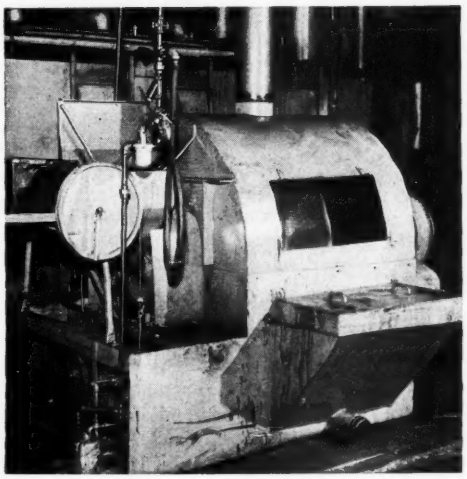
A chain drive rotates the drum in one direction for tumbling. When rotated in the opposite direction, parts feed into a discharge tub that takes them to a tote box. Machine is fully enclosed and vented to an exhaust system, minimizing fire hazard. Loading is done through a hopper at the drive end. A light hoist elevates tote pans that are dumped into the hopper, which is then covered.

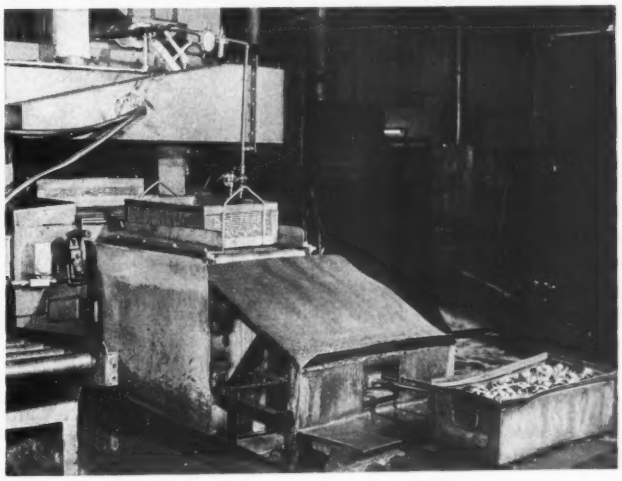
Parts washed in an alkaline solution are handled in a standard Detrex washer. Perforated metal baskets holding parts feed through this machine onto a short roller conveyor and are shifted into the shaker. Shaker gives baskets a transverse oscillating motion that dislodges any washing fluid.

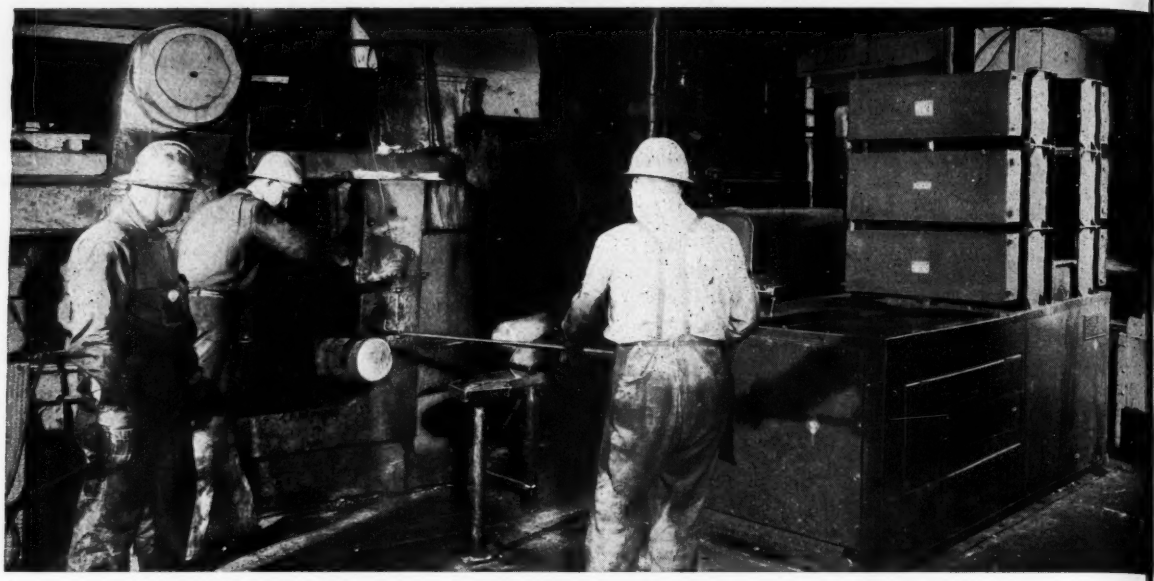
Parts remain less than a minute, then roll onto an incline at the bottom of which is a stop. Below stop is a shelf on which an empty tote box is set. Basket is inverted by hand and contents dumped into the tote box. Then basket is transferred to a roller conveyor for return to the washer. An air valve is opened and a ram in the air cylinder below the incline pushes loaded tote box onto a roller conveyor for outgoing parts.

Left below—Kerosene washer-tumbling barrel combination designed by Buick for deburring and washing screw machine products. Drum is chain driven and rotates in one direction for tumbling and the other for unloading

Below—Shaker used to remove washing fluid from blind holes and recesses of parts washed. Baskets slide down incline for dumping into tote boxes







Sixty-cycle power direct from the power line supplies energy for the 4000-pound induction billet heater, shown at right, used in connection with an upsetter

Plug-In Induction Heating

Direct from power line to workpiece, 60-cycle power provides compact induction heating unit for nonferrous extrusion billets, requires no motor generator set

By B. E. McARTHUR
Magnethermic Corp.
Youngstown

SWADDLING clothes to full development in four short years is the success story of nonferrous industry's fair-haired child—60-cycle induction heating. Currently more than 18,000 kw of 60-cycle induction heating equipment is in use. In the last three years, more than 80 per cent of all new aluminum extrusion presses installed have been equipped with induction heaters. There is a future for them in steel processing, too. Sixty-cycle heating has been applied for drawing purposes and stress relieving and has been used to preheat alloy steels prior to welding.

Growing popularity is due to several factors: Compactness of the induction unit; advantages of higher frequency induction heating without a motor generator set; low first cost and maintenance cost.

First large 60-cycle installation is in one of the Aluminum Co. of America's extrusion plants. Approximately 24 single phase units were installed, each consisting of an induction coil, transformer and main contactor, and necessary handling equipment. Capacity of each unit was approximately 2000 pounds per hour.

Magnethermic Corp. has developed a unit which provides a balanced three-phase load. Most of the units being built today are of this design. To provide a three-phase load, an induction coil consisting of three individual sections is used. Each section is supplied by a single phase transformer connected to one phase of the supply line. Taps in the transformer primary allow adjustment of input to each section of the induction coil. Tap switches have several functions. They can be adjusted to vary the input and consequently change the production rate. When billets shorter than full coil length are used, tap switch for empty or partially empty coil section can be adjusted to proper input to maintain the desired billet heat pattern.

Tapered Temperature—For some extrusions, better results are obtained by using a billet having a tapered temperature pattern. Tap switches then are set to give different power inputs to each section of the coil. In extrusion, the billet picks up heat due to the work of extrusion. Rear end of the extruded piece comes out at elevated temperatures, if heat is applied to billet uniformly. Poor surface and poor mechanical properties can result. Tapered heat overcomes these difficulties.

Illustrated is a three-phase induction heating unit. Billets are loaded on ramp at rear of heater, fed into the coil by means of an air cylinder. Located in the front of the coil is a billet stop. Stop is actuated by an air cylinder which positions it just before a

billet goes into the coil. When three-phase power energizes coil, magnetic forces tend to move the billet through the coil, and would throw it out if billet stop were not provided.

Automatic Controls—On the billet stop, an open-type, spring loaded thermocouple contacts the billet to measure temperature. When coil is loaded, power is automatically turned on and billet brought up to temperature. When desired temperature is reached, the power automatically cuts off. If operator wishes to use billet then, he ejects it by pushbutton. If left in the coil, billet is automatically held at temperature by the controller which turns the power off and on as required to maintain temperature. Hot billet is ejected by entrance of a cold billet into the coil. Discharge conveyor carries the hot billet away from the coil.

Power transformers are located beneath the coil. Water cooled, they are connected to coil by water cooled bus bars. Tap switches are located in a separate interlocked compartment on side of the machine.

The induction heating coil is wound with heavy copper tube. Turns are fiber glass insulated and are tightly compressed together. Compression prevents excessive vibration. These coils carry high currents and develop high magnetic forces between turns. Inside of coil is lined with additional high temperature insulation, protected by a stainless steel liner. On low voltage units up to 440 volts contactor is mounted inside the unit, while on high voltage units, contactors are enclosed in a separate cubicle, which can be located wherever desired.

Big Volume—One induction unit available heats 6000 pounds of aluminum per hour, to 850° F, at an average input of 750 kw. It is designed to heat 9 and 11-inch diameter billets, 36 inches long. For 9-inch billets, this means one billet every 2½ minutes.

An induction heater used in a forging application heats billets 8-inch diameter and 13 inches long. Billets move progressively through the coil which is long enough to accommodate four billets. Installation produces one billet heated to forging temperature every 30 seconds.

Interesting and unique problems occur in design and application of the 60-cycle induction heating equipment. One obvious problem is to get proper relationship between power input, heat required per output hour, number of billets per hour and number of induction coils.

There are definite limits to the rate at which power may be fed into a billet, because the heat produced in the billet is generated in the outer or depth of penetration layer. It must flow to the center of the billet by thermal conduction.

As the billets increase in diameter, heating time increases. In larger diameters it is often necessary to supply more than one heating coil in order to get enough billets per hour to meet the required production.

Ultrathin Strip Precision Rolled by Sendzimir Mill

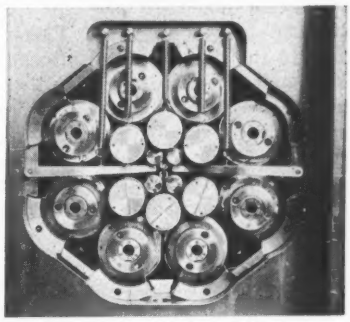
Mills for rolling ultrathin gage strip have been developed by the Armzen Co., Waterbury, Conn. Built by the Waterbury-Farrel Foundry & Machine Co., the mills will roll 4-inch wide strip down to 0.0002-inch thick. Maximum starting thickness is 0.010-inch.

Feature of this Sendzimir type mill is the tension control scheme. Strip tension can be controlled accurately between 10 pounds and 400 pounds. Mill is of the 1-2-3-4 design and construction is similar to the larger Sendzimir mills.

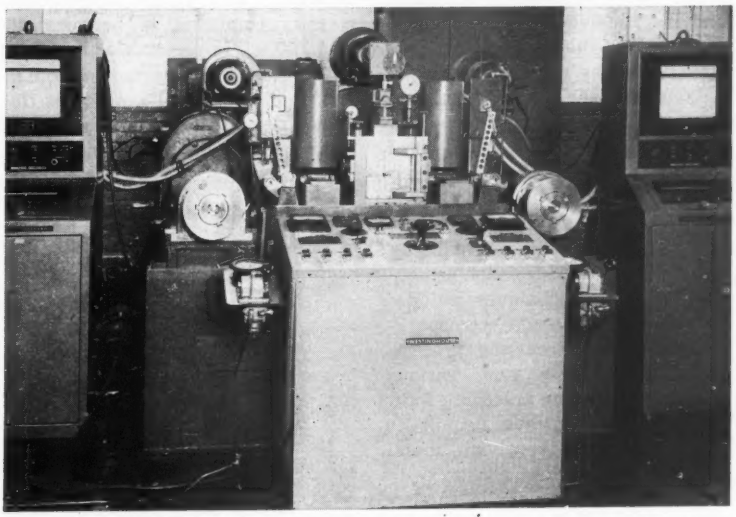
Powered by a 7½-hp motor with 3-hp winder motors mill has a top speed of 300 fpm. Mill, winders and drives are mounted on a single base. Operator's control desk is in front and adjacent to the mill. Thin strip product will find use in the electronics industry.

Two sister mills have been built for customers in the U. S. and one more is currently being built for England.

Key to the machine's ability to roll to 0.0002-inch thick is the ¼-inch work roll diameter.



Close-up view of the housing shows sets of intermediate and work rolls



Compact unit, this Sendzimir type mill rolls thin strip up to 4 inches wide. Maximum starting thickness is 0.010-inch. Finished strip can be as thin as 0.0002-inch

Shaping, Finishing Horizons Widen

Increasing carbide use and diamond bort shortage swings spotlight to new machining techniques. Four processes and combinations thereof are available

ELECTROMECHANICAL, electrochemical and ultrasonic processes offer promise for shaping and finishing hard-to-work materials in addition to conserving limited supplies of diamond bort. Eight specific operations where new processes for machining and grinding may be needed are emphasized in a report by the Minerals and Metals Advisory Board of the National Research Council.

Diamond wheel grinding accounts for about 70 per cent of diamond bort consumption, being to date the only practical method for shaping and finishing cemented carbide tools and tungsten carbide projectile cores. With the material already in short supply and military items using more and more hard-to-machine materials, the need for developing new processes not requiring diamond bort is immediate.

Work Range—Electromechanical and electrochemical processes are limited to shaping and finishing electrically conducting bodies like metals and carbides. Abrasive methods, including diamond wheel grinding and ultrasonics, are capable of cutting all hard materials.

Excluding various ramifications of methods employing bonded or coated abrasives, there are several processes under development which might be substitute methods for diamond wheel grinding operations or have possibilities for machining and grinding hard-to-machine materials. These techniques include: Electrolytic process, electrosparking process, electroarcing process, ultrasonic process and various combinations of the preceding four.

Electrolytic grinding usually is performed by a revolving metal disk cathode in close proximity to an anodic workpiece while an electrolyte is applied to the disk and workpiece in the same manner as a coolant is applied to a grinding wheel and work (STEEL, Mar. 17, p. 84). The method is usable for removing stock from electrically conducting bodies such as metals or metal carbides. It appears especially suited for removing stock from large surfaces, but its applications are limited where very small surfaces need be ground or for drilling of small diameter deep holes.

Deep Holes—In the electrosparking method, stock is removed by making the work one of the electrodes in the circuit. Rapidly pulsed current of the spark discharge type is passed between the work and the other electrode in a dielectric fluid. The method is used for removing stock from electrically conducting bodies such as metals or metal carbides and is especially suited for forming small diameter, deep holes of any shape.

The process is characterized by relatively high electrode consumption. Local heating is not experienced under ideal operating conditions. The range of voltage usually employed is between 40 and 300 v. In a pure electrosparking process the electro-discharge is initiated by the voltage across the dielectric. Process is electromechanical, stock being removed by a sparking action and metal or metal carbide particles carried away suspended in the dielectric fluid.

Fast Work—Cutting by the electroarcing process makes work the anode with an arc maintained between work and cathode. The method usually utilizes pulsating direct current using a moderately conducting electrolyte such as water glass solution. Suitable for rapid cutoffs of hard metals and carbides, process may be faster than existing cut-off procedures. In a pure electroarcing process, somewhat rough finishes are obtained.

Low voltages of less than 25 v usually are used. For a pure electroarcing process the electro-discharge is initiated by contacting the electrodes and current is carried by vaporized metal ions. The process is characterized by the deposition of some nonconducting film (such as silica) on the work and high local heating is evidenced with moderate consumption of the cathode. As in the electrosparking method, electroarcing is essentially electromechanical in nature.

Process Differs — Ultrasonic process does not utilize electric current directly for stock removal. Cutting or stock removal is accomplished by abrasive action at high

(*Please turn to Page* 140)

Job Item or Operation	% Use of Diamond Bort	Applicability of Methods — Diamond Wheel Grinding	Electrolytic	Electrosparking	Electroarcing	Ultrasonic
Sharpening single-point tools	30	A	B	B	C	B
Grinding single point tool chip breakers	20	A	B	B	C	B
Sharpening milling cutters and broaches	15	A	B	B	C	B
Grinding projectile cores	5	A	B	B	C	B
Shaping and finishing dies	4	A	D	A	D	A
Forming turbine bucket attachments	..	B	B	B	C	B
Rifling gun barrels	..	B	C	B	C	B
Machining and grinding compressor disks	..	B	B	B	C	B

A. In use on production scale.
B. Appears applicable; promising but limited experimental data to date.
C. Questionable applicability; not promising but might be developed to be promising.
D. Limited applicability or not applicable; not usable in present state of development.

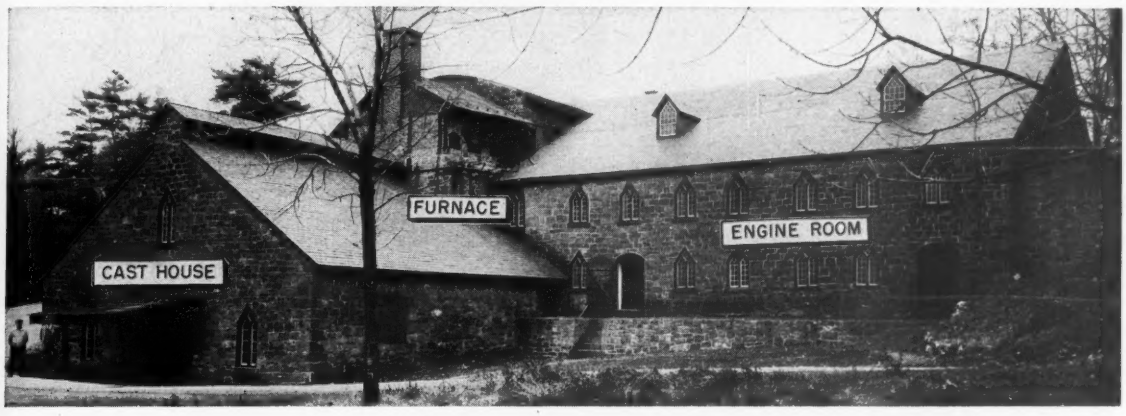


Fig. 15—Cornwall furnace, Cornwall, Pa., built in 1742—the only old stone furnace remaining in this country in operating condition. Courtesy Compressed Air Magazine

BLAST FURNACE PRACTICE... *The Raw Materials Problem—IX(a)*

Development in the art of producing iron in a blast furnace has advanced with better understanding of raw material properties and their effects on operating economy

NECESSARY materials available to the great majority of United States blast furnaces for nearly 100 years (Lake ore and Middle West coal) have had chemical composition and physical properties naturally favorable to operating economy. More attention has been given to the development of mechanical equipment for better application of heat to natural raw materials than has been given to the preparation of natural raw materials for a better reception of heat, or to the development of the understanding of the effects of raw material chemical composition and physical properties upon efficient use of heat. But forced beneficiation of the low-grade raw materials, which the industry is facing today, makes recognition and understanding of these effects of paramount importance.

The accompanying illustrations of three blast furnace plants tell a story at a glance which would require pages of written words to relate. There is little difference in general appearance between the Cornwall furnace (Fig. 15), built in 1742, and the Sharpsville furnace (Fig. 16), built a century later in 1846, but there is tremendous difference in appearance between Sharpsville furnace and the No. 5 stack of Republic Steel Corp., Cleveland, (Fig. 17), built another century later in 1943. These differences in physical appearance of the respective plants of the two centuries is mute evidence of the slow rate of development in the blast furnace industry prior to the major change in raw materials and the tremendous difference which such changes caused and permitted.

Stack Is Preserved — Cornwall furnace, Cornwall, Pa., was built in 1742[11, 13] by Peter Grubb, and produced iron until 1882. The length of time this furnace operation was able to remain in a commercially competitive position is believed to be conclusive evidence of the slow rate of development in furnace design and operating practice methods during its lifetime. The furnace is now owned by the Pennsylvania Historical Commission and is probably the best preserved of any of the old furnaces in the country. The stone stack and the wooden blowing tubs, which were powered by a wooden water wheel through a wooden shaft, gears and pinions, are relics of the past but they are of great interest to blast furnace operators and engineers of the present era; the dearth of scientific and engineering data available at the time of their construction engenders respect for those who conceived and operated them.

In 1785 one of the heirs of Peter Grubb, a grandson also named Peter, sold his share of the "Cornwall Ore Hills, Cornwall Furnace, and appurtenances", to Robert Coleman, reserving the right for sufficient quantity of ore for *one furnace, as long as grass grows and water flows.* This very elastic reservation resulted in a famous law suit in the 19th century

By CHARLES E. AGNEW
Consultant
Blast Furnace and Sintering Plant Operations
Cleveland

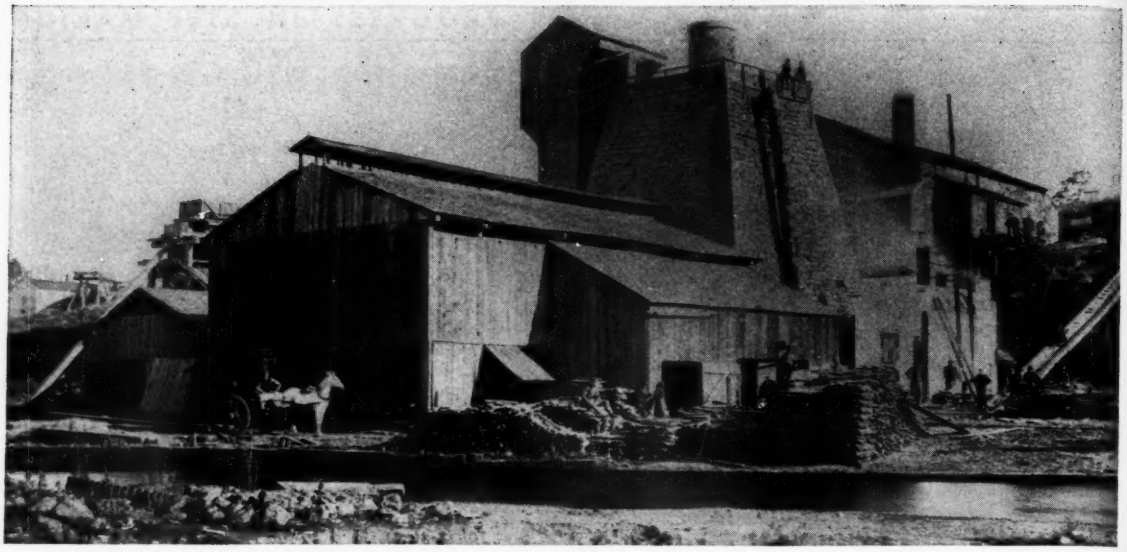


Fig. 16—Sharpsville old stone blast furnace, Sharpsville, Pa., built in 1846. First Lake iron ore to be used in a blast furnace was smelted here

(Aldens Appeal Record-Coleman vs Brooks), but the clause could not be broken and remained in force until April 18, 1927 when Bethlehem Steel Co. purchased Robesonia furnace, Robesonia, Berks County, Pa., who then owned the ore contract, and leveled the stack to the ground.

The perspective gained from a visit to the historic Cornwall furnace by anyone engaged in the iron and steel industry is well worth the time required to make it.

Used First Iron Ore — Sharpsville furnace, Sharpsville, Pa., was built in 1846 by the firm of Vincent & Himrod, assisted by Joseph and John McClure, and was first called "Blanch" furnace[12]. Operation was not successful and after a short time the furnace stood idle until 1853 when it was bought by David and John P. Agnew who, about one year later, sold it to James Pierce. During the Agnew ownership the first shipment of ore made from the Great Lakes region was used in the furnace. The ore came from Jackson mine, pioneer of all Great Lakes ore mines. Shipment was made before completion of a railroad to the mine, or building of docks at Marquette, Mich. Also in 1853, 3 or 4 tons of the ore were shipped to the Worlds Fair at New York.

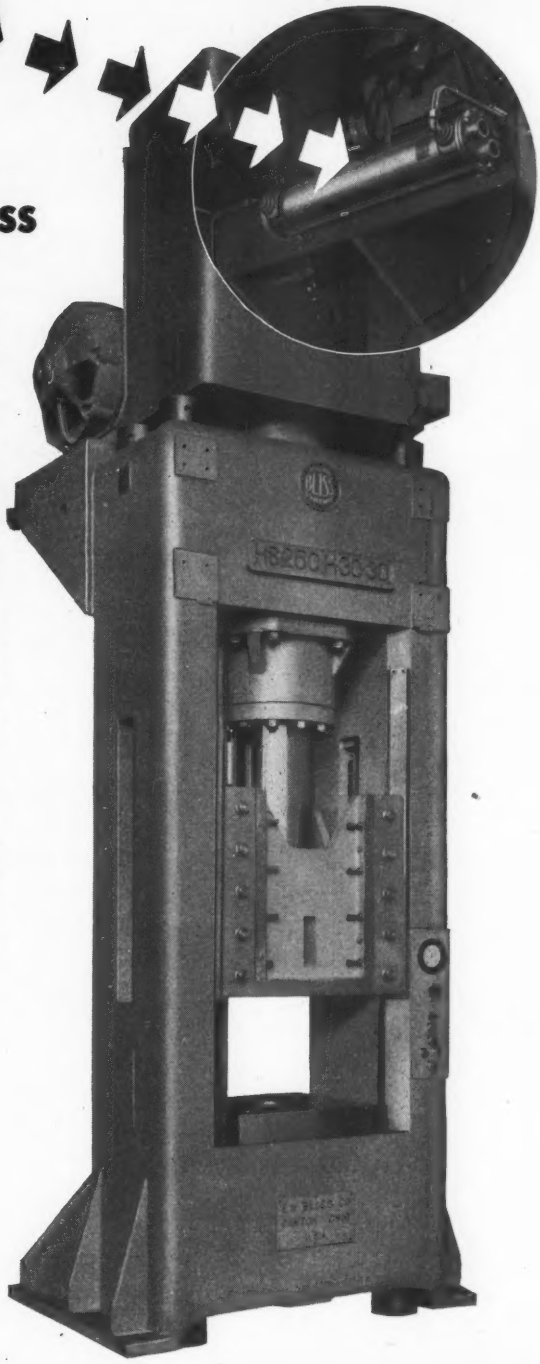
The historical data pertaining to the ore shipment are recorded by Swank[13]. The ore for Sharpsville furnace was transferred from a Lake sailing vessel to a canal boat at Erie, Pa. From this small beginning grew the mighty iron ore industry of the Great Lakes region.

Sharpsville furnace plant buildings were rebuilt in 1870. It is assumed Fig. 16 was taken about that time. In 1870 the Pittsburgh & Erie Railroad Co. bought control of the canal company and soon after discontinued all shipment by canal. Consequently, raw material handling facilities at the furnace plant would have had to be rearranged to accommodate railroad

Fig. 17—No. 5 high pressure furnace, Republic Steel Corp., Cleveland, which was first blown in Oct. 28, 1943

to prevent oil thinning through overheating

a Ross Exchanger stands guard over this Bliss Hydro-Dynamic® Press



Whether you're working with sheet, plate or powder, Bliss is a good name to remember. For the E. W. Bliss Company of Canton, Ohio, is said to build more types and sizes of presses than any company in the world.

Likewise, when seeking assurance of a dependable oil cooling system, Bliss is again a good name to remember. For, Bliss Hydro-Dynamic Presses are equipped with compact, efficient coolers to prevent overheating and consequent thinning of the hydraulic oil . . . a condition that could well lead to pump slippage and lost capacity.

The 250-ton, single action, housing type Bliss Model HS-250-H-30-30 (shown) is typical. On it, a Ross Type BCF Exchanger handles the oil cooling assignment.

Say Bliss engineers: "Ross Exchangers have been giving us very good service and we like the way they withstand the pressures they are subjected to on our presses."

And that's the way most builders of hydraulic machinery and other equipment feel about these fully standardized, copper-and-copper alloy units that are so promptly obtainable from Ross stock. No doubt you will think the same when you become familiar with *all* the advantages of the famous Ross "BCF". For details request Bulletin 1.1K5.

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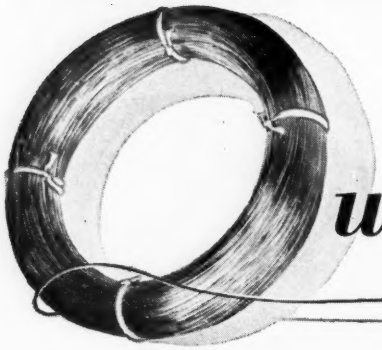

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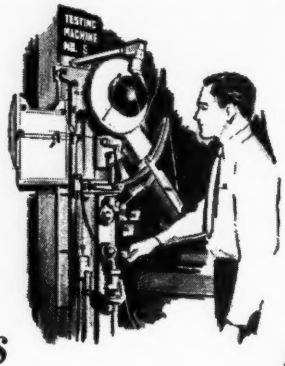

Not only Music Wire, "the wire of a thousand uses," but a complete line of quality specialty wires is made by Johnson, including vacuum hose wire, aircraft cable wire, high carbon rope wire, hard drawn spring wire, oil tempered spring wire, high tensile galvanized steel wire, hose reinforcement wire (braided type), flat and half oval special spring wire, brush wire for hand and power brushes.

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instead of canal delivery. The Pittsburgh Coke & Chemical Co., last owners of the plant, completely dismantled it in 1946, just 100 years after the building of the original furnace.

Authentic historical data available[11] give dimensions of Cornwall furnace as 30 feet high and a 9-foot bosh. For many years production from the furnace averaged 2½ to 3 tons iron per day, with increase to 4 to 4½ tons toward the end of the century. These dimensions and production figures are representative for furnaces of the eighteenth century, and practice methods used at Cornwall were representative of that era and of all previous furnace operations in early colonial or later United States furnaces until well into the nineteenth century.

Comparison of Furnace Data—Similar specific data regarding dimensions and production for Sharpsville furnace are not now available, but from various objects of known height, which are visible in the photograph, the furnace must have been 35 to 40 feet high. With such furnaces a 9-foot bosh and daily production of 5 to 6 tons iron per day were representative of furnaces of the Sharpsville furnace era. Cornwall furnace used wood charcoal for fuel, and magnetite ore (Fe^3O^4) which was native to its location. Sharpsville furnace used raw block bituminous coal for fuel and carbonate ore ($FeCO^3$), both native to its location.

This limited comparison of Cornwall and Sharpsville furnaces reveals that in a full century there was little noticeable change in the type of construction or size of furnaces.

Location of the two furnace plants with regard to their raw material supply also is important because at the Sharpsville furnace facilities for transporting raw materials from a distance, and the factor of raw material assembly cost, are introduced into plant operating economy. These two factors were destined to have tremendous influence on development of the iron and steel industry of the United States. It is a historical fact that all early furnaces were located near to their ore deposit.

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AIRLESS BLAST CLEANING

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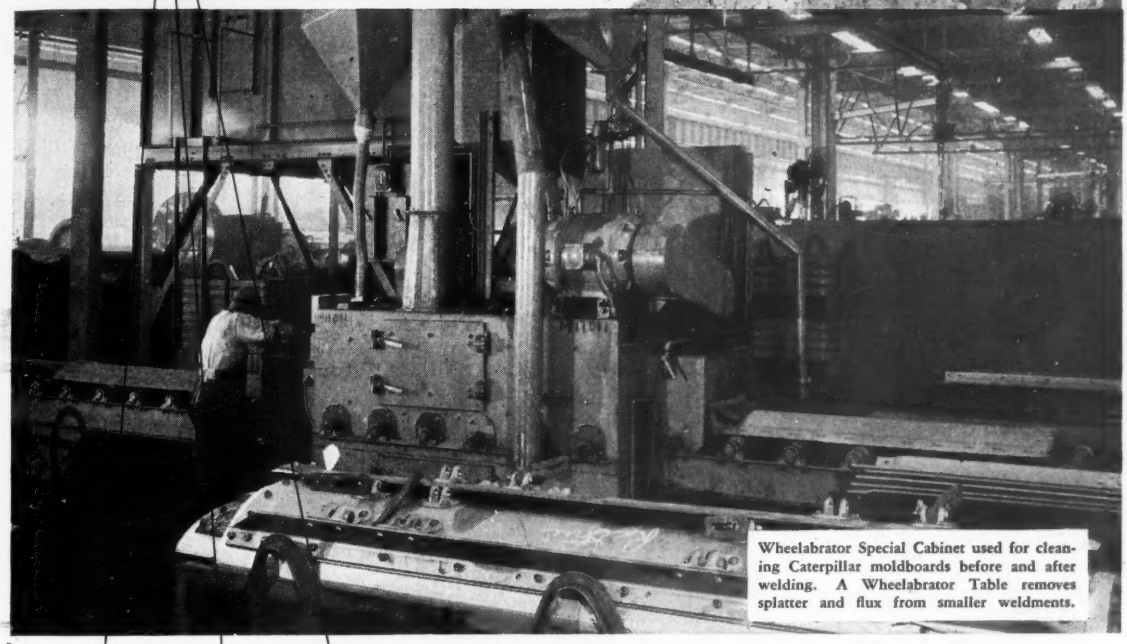

Wheelabrator Special Cabinet used for cleaning Caterpillar moldboards before and after welding. A Wheelabrator Table removes splatter and flux from smaller weldments.

1 Provides a thoroughly clean surface for welding.

2 Eliminates costly grinding, buffing and polishing.

3 Earth scours readily over a Wheelabrated surface.

In building equipment like the giant Caterpillar earthmovers, welds that will take terrific punishment are a requisite. To obtain these tight welds, a thoroughly cleaned surface is of prime importance.

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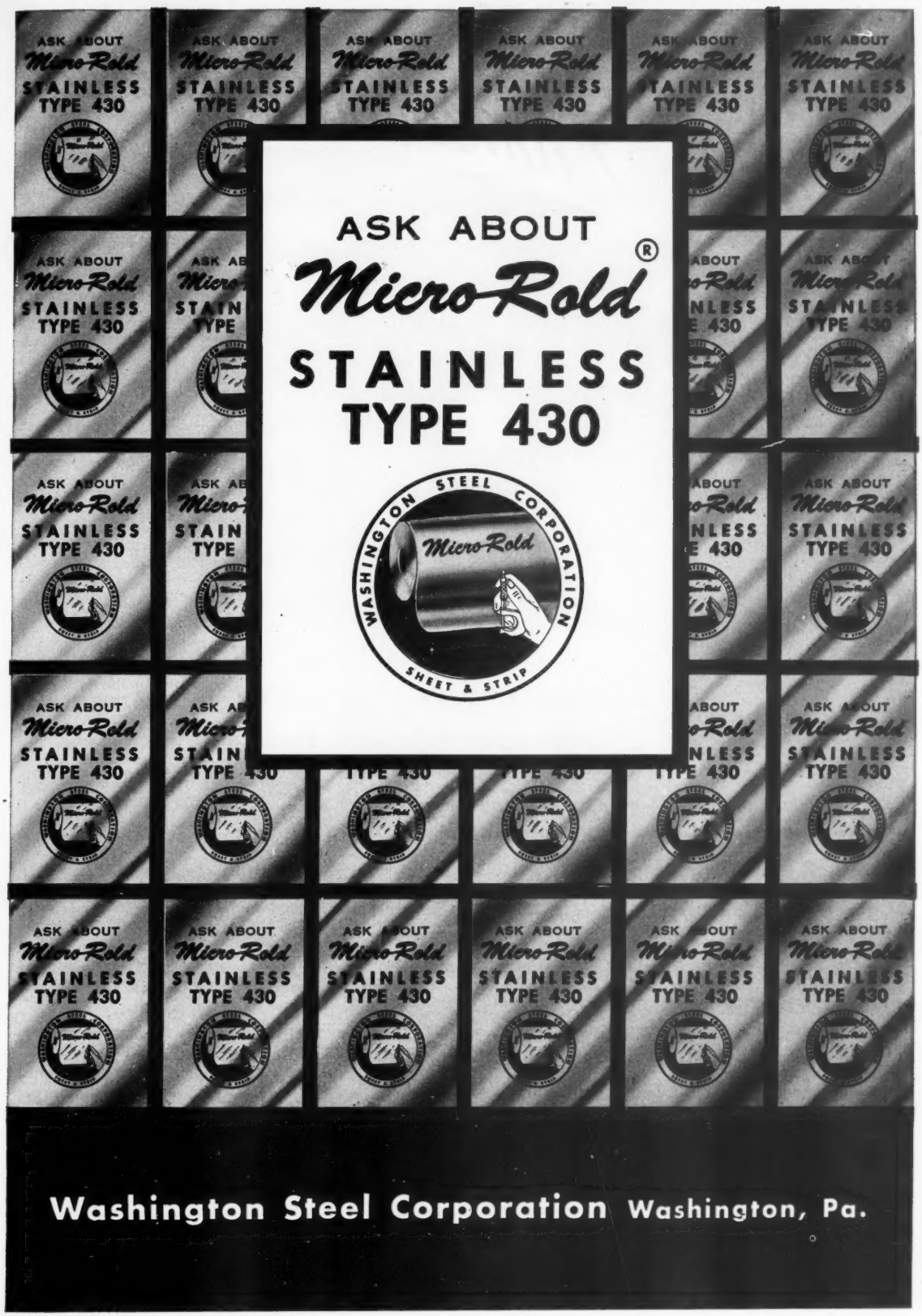
It was fortunate in those early days that there was an abundance of forest growth wherever ore was found, from which charcoal could be produced at the same location as the ore deposit. If this had not been possible the furnaces would not have been built because there were no adequate facilities for transporting either raw material any great distance.

Although the first furnaces built in Western Pennsylvania used wood charcoal for fuel, the location of the Sharpsville furnace, and most other furnaces in the Shenango Valley of Western Pennsylvania and the Mahoning Valley of Eastern Ohio, was determined by the presence in the vicinity of high-grade block bituminous coal which could be used in a blast furnace in its raw state, and transportation facilities (canal) which made it possible to bring coal and ore to the furnaces. The Erie & Pittsburgh Canal was opened to navigation in December, 1844[12], and the first railroad to serve the Shenango Valley began operations in October, 1864[12].

Local Ores Were Smelted — All furnaces in the localities mentioned depended on local ores, which were largely carbonate[12], and few operations were commercially successful. It was an economic necessity, not choice, that forced the owners of those pioneer middle west furnaces to look elsewhere for an ore supply which could be smelted economically. Conception of using ore from Michigan, 800 miles away, would have been fantastic without transportation facilities (lake vessel and canal boat) to deliver it to furnaces at reasonable cost. With regard to this earlier problem of iron ore supply for middle west furnaces it is of interest that as late as 1876 considerable ore was brought from Missouri to the Pittsburgh district[13].

Until the quarter century preceding 1850 apparently there was little effort made in the United States to improve blast furnace practice methods from what they had been from earliest colonial days. At the time cited most of the furnaces in this country were located in Eastern Pennsylvania, charcoal being used for fuel. It is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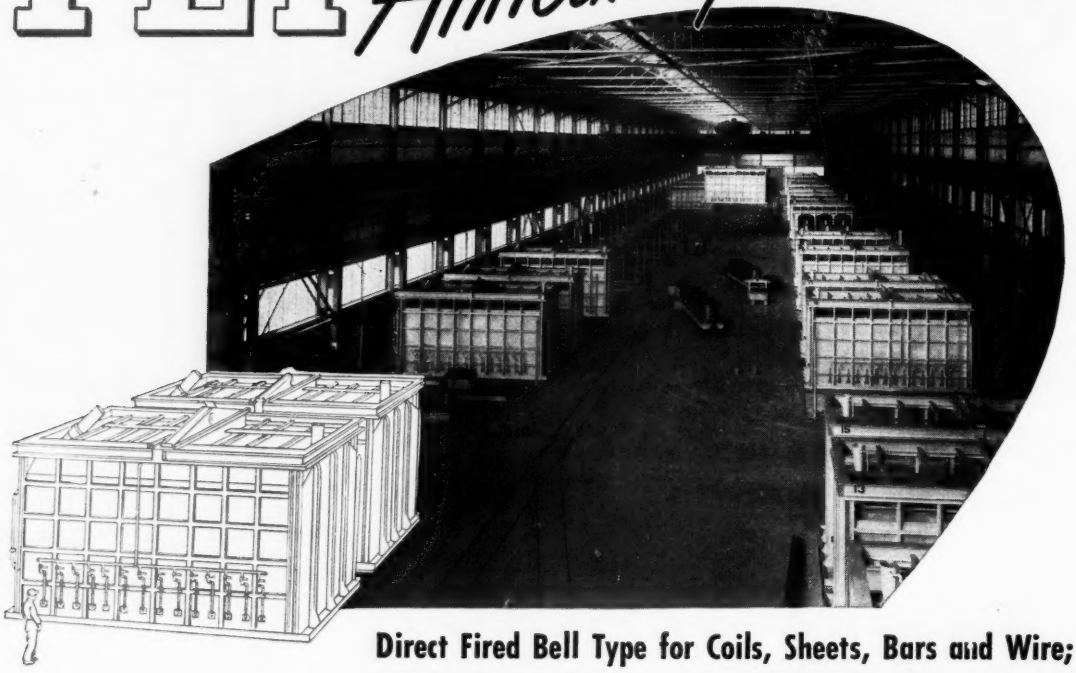

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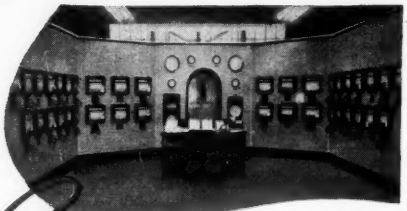

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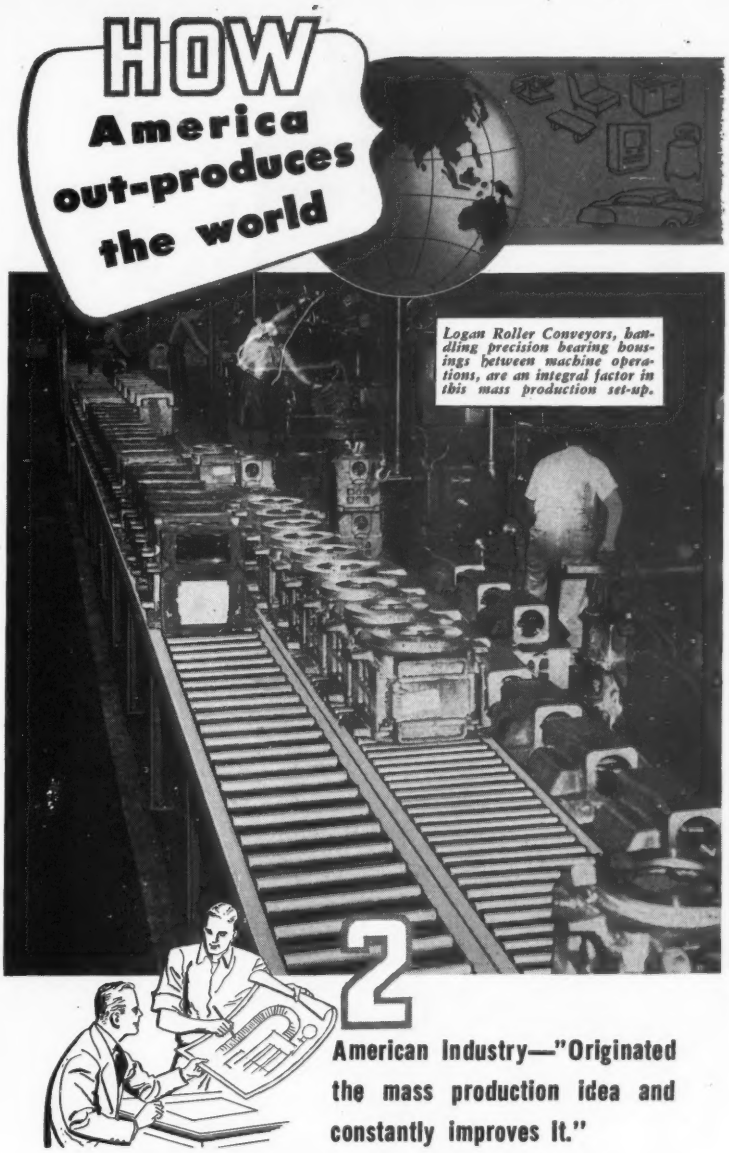
9

historical fact[13] that whereas for many years the supply of wood for producing charcoal had appeared to be inexhaustible, the time came when some furnaces were abandoned because of the lack of it. This earlier condition of thought with regard to fuel supply is comparable to thought which has existed for many years of the present era with regard to "inexhaustible" supply of naturally rich ores of the Lake region.

Although coke had been used in England for blast furnace fuel since early in the eighteenth century there was not any serious attempt to use it in the United States until early in the nineteenth century when various attempts were made to use bituminous coke and anthracite coal instead of charcoal, both with indifferent success. According to Swank[13] the first successful use of bituminous coke in the United States occurred at the Fairchance furnace, near Uniontown, Pa., and of anthracite coal in 1838 at several Eastern Pennsylvania furnaces. Prior to these dates all furnaces in the United States used wood charcoal. The whole country progressed so slowly in the manufacture of pig iron from raw bituminous coal and coke that total production from these two kinds of fuel in 1849 was only 54,485 tons: Pennsylvania making 29,941 tons; Ohio, 15,000 tons; and other states 9,544 tons[13]. But by 1876 production of pig iron with bituminous coal and coke exceeded that of anthracite, and was more than treble that of charcoal. In that year production of pig iron was as follows: Bituminous coal and coke, 990,009 net tons; anthracite, 794,578 tons; charcoal, 308,649 tons; total 2,093,236 net tons.

At present there is only one charcoal furnace[14] in the United States, none using anthracite or raw bituminous coal, all others using bituminous coke.

Time Element Involved—This recital of transition in blast furnace fuels has been outlined in a few paragraphs but actual transition covered three quarters of a century, and the history of it makes interesting reading. The raw material problem of fuel supply, which had to be solved in that former era, is comparable in many re-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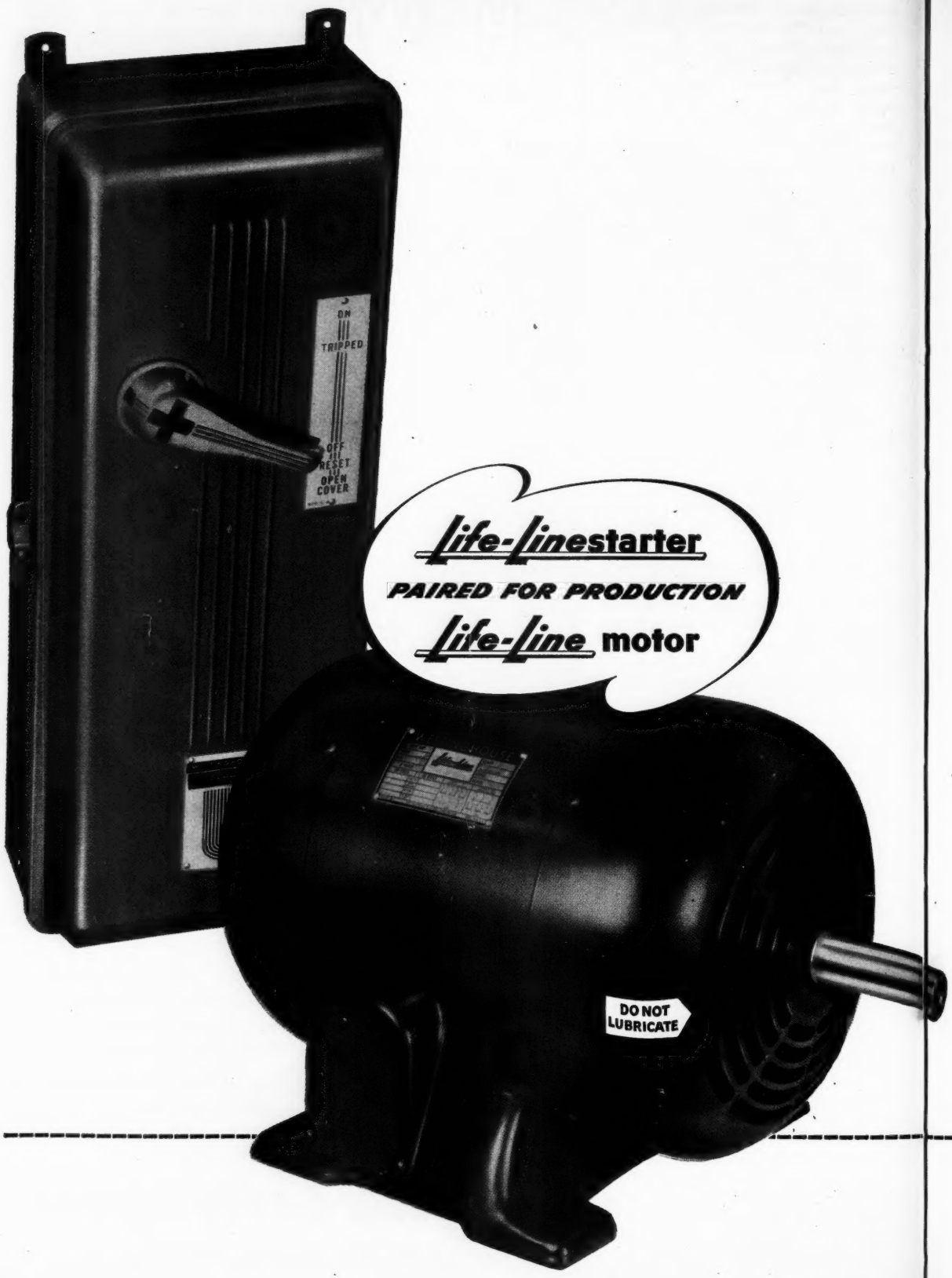
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spects to the raw material problem of ore supply which must be solved in the present era. The generations of blast furnace operators who spent their lives using charcoal only could not have any conception of the effects which the change in fuel would have on furnace practice, and the generations, which were forced to accept and develop those changes, had to learn to adjust their practice methods to meet the requirements of the change in fuels.

During this early period of experimentation with fuels, the ores used were from the same local sources. In studying the development of blast furnace practice methods it is important to remember that molecular formation of iron oxides in natural ores has not changed since nature formed them; they are the same today as they were in the crude operations of Cornwall and Sharpsville furnaces. Nor has there been any change in the amount of heat required to reduce a pound of Fe from respective oxides to the metallic state; or in the amount of heat which it is possible to generate from combustion of a pound of carbon. Some natural ores used in furnace operations during the century between the building of the Cornwall and Sharpsville furnaces were as rich in iron as those used in the century between the building of the Sharpsville and Republic's No. 5 furnace.

It follows that continuous improvement in furnace practice and productive capacity of furnaces came from a better understanding of the application and use of heat rather than from any change in the amount of heat required, or in the oxide formation in ores. These comments may appear trite but it is believed they are pertinent to the subject in view of panaceas sometimes heard which are suggested as solutions for the present problem of iron ore supply.

Formation Remains Unchanged—Just as molecular formation of iron oxides in ores have remained unchanged since nature formed them so has molecular formation of gangue in all natural raw materials remained unchanged. In early days with furnaces being located near an ore deposit, the iron

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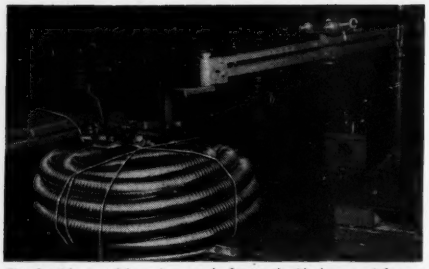

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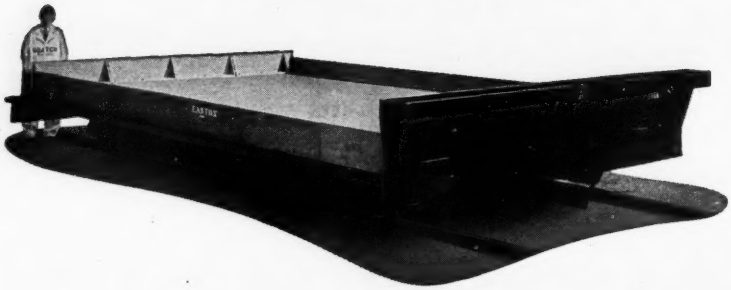

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produced was natural iron from that particular ore. There was little knowledge of, or opportunity for blending ores; consequently, slag from such operations would be natural slag with little opportunity for practicing slag control which in the present era is recognized as indispensable. In the light of present-day knowledge of the importance of slag composition to control furnace operation, it is not difficult to understand the cause of many operating difficulties experienced at early furnaces, or for the length of time required by early operators to solve their problems.

Since the natural ores varied in iron content from 30.00 to 60.00 per cent, a wide variation in gangue content, and in ratio of gangue constituents to each other, would be inevitable, with proportionate effects on slag mineral compositon and thermal requirements.

Of the different fuels which have been used for blast furnace operation, wood charcoal is the lowest in ash and sulphur content, and it is the only one where ash is self-fluxing. Theoretical and actual furnace practice data prove the ash content of fuel to be a most important consideration from the viewpoint of slag, chemical and mineral composition, stages of formation in the furnace, temperature and volume of heat required, and weight produced per ton of iron. A change from charcoal to coal or coke would bring each of the cited factors into some degree of bearing on the thermal requirements and the fuel rate of operation.

Physically, wood charcoal is of weaker structural strength than either coal or coke and would have a proportionate effect on the mechanical action of supporting the stock column in the furnace.

The present generation of blast furnace operators know coke ash will supply approximately 25.00 to 30.00 per cent of the slag constituents, and generally that a greater part of the alumina content in the slag comes from coke ash than comes from ore gangue. In search for refinements in furnace practice, ratio of ore gangue to coke ash is of great importance,

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but without the research which has made the knowledge available operators of previous generations could not know it, or at least know the cause of it.

Aided by Heated Blast—It is significant that neither anthracite coal nor bituminous coke was used with any real success until the practice of preheating the blast came into use[13] (English patent 1828). It is important to remember that through years of trying different fuel, the character of ores used or the amount of heat required for smelting them was not any different than it had been with use of charcoal, *only the heat requirements of slag had changed.* With a change of fuel additional fluxing stone was required for the fuel ash and the natural source of supply would be the most convenient limestone quarry, but there was little, if any, understanding of the effects of the stone chemical composition on the slag composition.

Research, however, disclosed that mineral composition and increased weight of slag were the causes of difference in the thermal requirements between the use of charcoal and anthracite, bituminous coal, or coke. The unrecognized difficulties encountered with the change in fuels were practical demonstrations of the "critical hearth temperature" which Johnson[1] was to recognize many years later, and the influence of the slag mineral composition on thermal requirements, disclosed by McCaffery[3] many years later.

The need for more hearth heat, caused by the change in slag mineral composition and weight, could not be met with cold blast; but with preheated blast supplying the need, "the critical hearth temperature" could be maintained with benefit to both productive capacity and fuel rate. Use of hot blast might well be considered the first step in the modern conception of the *efficient use* of heat in blast furnace operation.

In the study of furnace practice development and raw materials it is important to remember that the fuel changes in this earlier raw material problem affected the hearth and bosh operation to a much greater extent than it did

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the shaft operation, and the ore change which followed (from local to Lake ores) had a greater effect on the shaft operation than it had on the bosh and hearth operations. The effect of the first change came from nonvolatile fuel ash and the second from the volatile matter contained in ores.

(To be continued)

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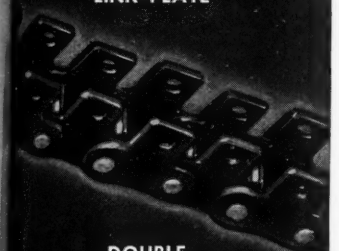
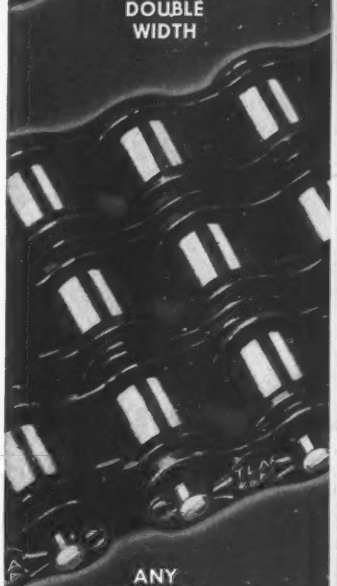
...A Chain for Every Drive!





ATLAS OFFERS YOU A FULL LINE OF PRECISION-BUILT "SUPER LIFE" ROLLER CHAIN FOR EVERY SERVICE

From tiny timers to big tough drives . . . from fractional horsepower motors to mighty giants, Atlas offers you a wide selection of durable "Super Life" roller chain and attachments—all precision-built for extra wear . . . smoother, positive power.

Singles or multiples . . . regular or heavy duty . . . standard or extended pitch . . . steel, stainless steel or bronze, you'll find the rugged chain you need in the complete Atlas line.

Precision-made from specially selected steels, Atlas gives you longer life in every link. Pins and bushings are *case-hardened,* each link plate and roller *toughened*—by an exclusive Atlas heat-treating process. Built-in stamina provides extra strength to take the heaviest loads—whether uniform, uneven or severe shock.

Whatever your requirements, you can depend on Atlas for longer wear over the long pull. An Atlas engineer will gladly recommend the right roller chain for years of efficient, trouble-free service.

ATLAS CHAIN AND MANUFACTURING CO.
Philadelphia 24, Pennsylvania

Send For New Roller Chain Fact Book No. ARC-525

ATLAS

ATLAS ROLLER CHAIN

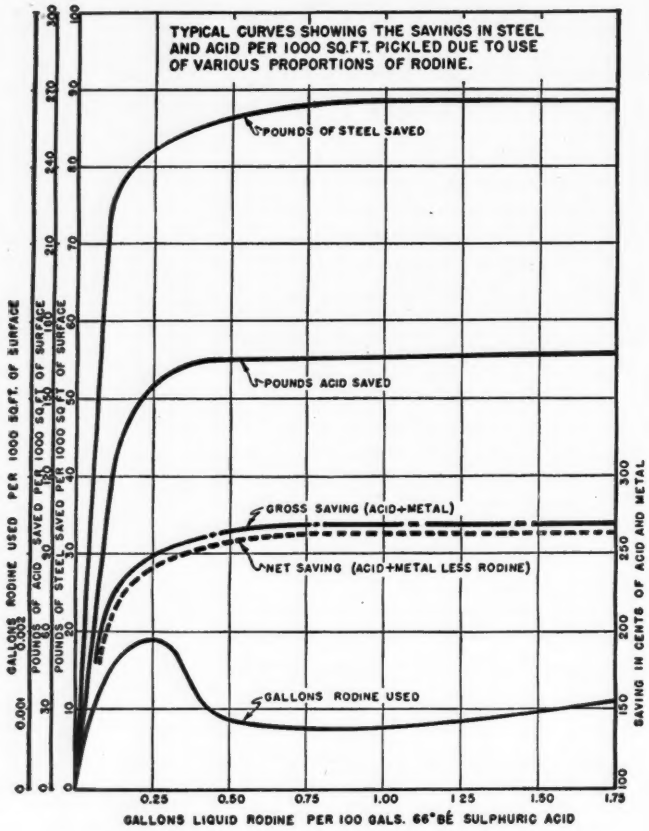
AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet

Subject: EFFICIENT PICKLING WITH "RODINE"®

A. SAVINGS POSSIBLE WITH "RODINE"


TYPICAL CURVES SHOWING THE SAVINGS IN STEEL AND ACID PER 1000 SQ.FT. PICKLED DUE TO USE OF VARIOUS PROPORTIONS OF RODINE.
POUNDS OF STEEL SAVED
POUNDS ACID SAVED
GROSS SAVING (ACID+METAL)
NET SAVING (ACID+METAL LESS RODINE)
GALLONS RODINE USED
GALLONS RODINE USED PER 1000 SQ.FT. OF SURFACE
POUNDS OF ACID SAVED PER 1000 SQ.FT. OF SURFACE
POUNDS OF STEEL SAVED PER 1000 SQ.FT. OF SURFACE
SAVING IN CENTS OF ACID AND METAL
0.25
0.50
0.75
1.00
1.25
1.50
1.75
GALLONS LIQUID RODINE PER 100 GALS. 66°BÉ SULPHURIC ACID

B. TYPICAL APPLICATION OF "RODINE"

Pickling shell cases in uninhibited muriatic or sulfuric acid contributes to their embrittlement and makes it difficult to draw them without breakage. By adding a small amount of "Rodine" to the pickle bath, embrittlement is suppressed and more than enough acid is saved to pay the costs of the inhibitor.

CHEMICALS ACP PROCESSES WRITE FOR DESCRIPTIVE FOLDER ON "RODINE" AND INFORMATION ON YOUR OWN PICKLING PROBLEM. CHEMICALS ACP PROCESSES

Finishing Horizons Widen

(*Continued from Page* 120)

frequency and low amplitude. Unlike the electro-processes, the ultrasonic technique grinds nonmetals or nonelectrically conducting bodies as well as electrically conducting materials.

In the ultrasonic process, the cutting or grinding tool usually is vibrated in the frequency range from 16,000 to 29,000 cycles per second through an amplitude of not more than a few thousandths of an inch. The abrasive, which is usually 280-grit boron carbide, is carried in water to the tool and work. Other grit sizes and abrasive compounds, such as aluminum oxide and silicon carbide, may be used but these do not last as long as boron carbide. Consumption of the tool occurs during grinding and machining.

Combined Operation — In addition to the four processes described, machines may be devised for effecting combinations of some of these four processes. For example, the combination of the electrolytic and diamond wheel grinding has been tested and is being developed. For this combination process, a metal bonded diamond wheel must be used for the cathode. The diamond particles act as insulating spacers separating the work from the wheel, and as scrapers.

Machines have been tested and are being designed for effecting machining and grinding by electrolytic and/or electroarcing actions. The same electrolyte or more than one electrolyte might be used by the same equipment which will serve for either the electroarcing or the electrolytic process.

First consideration in the selection of job items is the current use of diamond bort for performing the operations in accordance with present day practices. These operations involve principally diamond wheel grinding. Other finishing and forming operations of hard-to-machine materials, needed for the preparedness program, must be evaluated. Diamond wheel grinding or some other form of diamond cutting might be suitable for some

BULLARD

MANUFACTURERS OF MACHINE TOOLS

White Fish Bay, Lake Superior and ice bound ore carriers

U. S. Steel Photo

The Invisible Background of Industrial Progress

Transportation of ore from the mines to basic industry is a large and important operation that is relatively unknown to many of us in view of the usual availability of the most common finished consumer products. The ore carriers in the illustration, although temporarily ice bound and awaiting an ice breaker to cut a path to open water, depict the scope of operations necessary for the transportation of iron ore from the mines through the Great Lakes to the blast furnaces. . .

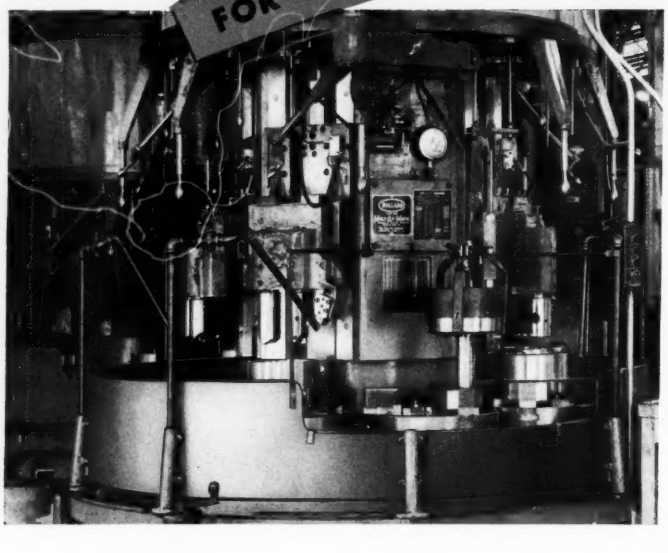
As machine tool builders we are proud to have contributed a part in the building and maintenance of these huge ore carriers as well as the cranes, conveyors and numerous other dock and loading facilities necessary to their operation. . .

★ *Modern Machine Tools* and large scale operations make possible constant cost reductions, enabling the mines, transportation and the manufacturing industries to produce more and better products at greater savings, creating a higher standard of living for the American people.

THE BULLARD COMPANY
BRIDGEPORT 2
CONNECTICUT

★ *For greater manufacturing economy REFER to next page*

BULLARD MACHINE TOOLS
FOR GREATER MANUFACTURING ECONOMY



The Mult-Au-Matic Method of machining work originated back in 1914.

This method, whether it is with 4, 6, 8, 12, or 16 spindles, has a basic time element for Manufacturing Economy. The time to produce a finished piece of work is equal to the time for the longest operation plus a few seconds for indexing.

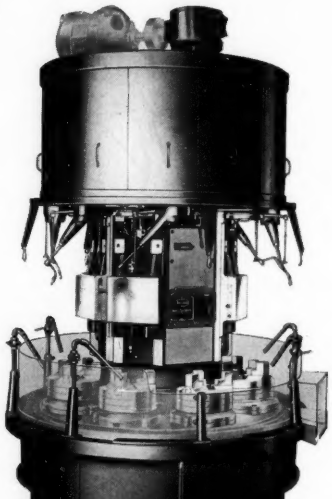
Mult-Au-Matics are considered now, more than ever before, as Key Units for repetitive machining of work where Accuracy and Fast Economical Production are the requirements.

Iron ore transported from the mines, and processed, provides the base material for iron castings, steel forgings and bar steel so essential to our Economic World of today.

From these forms thousands of different pieces of varying design are produced by industry on Machine Tools.

Mult-Au-Matic work is not confined to any one field of Industry but extends over a wide range of products.

The Automotive Industries have always been the largest users of these machines. However, the flexibility of tooling fits Mult-Au-Matics for practical use in the manufacture of fractional horsepower electric motors, tractors, mechanical farm equipment, power lawn mowers, outboard motors and nearly any class of work where boring, turning, facing, drilling and reaming operations are called for.



For Manufacturing Economy use Mult-Au-Matics. Built in 8-, 12-, 16-, and 34-inch sizes with 4, 6, 8, 12, or 16 spindles according to the specific model.

BULLARD

THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

of these latter job items, but if they are to be produced in the large quantities anticipated, there aren't enough diamonds in the world to do the job because the diamond bort supply is hardly adequate to perform the operations currently under way.

Accompanying table contains eight important machining and grinding type operations, which cover the important job items described above. They are listed in order of current diamond bort consumption and account for approximately 74 per cent of the diamond bort consumed in the United States. This tabulation indicates the estimated applicability of the new machining and grinding methods, including diamond wheel grinding. These applicability ratings are based on current knowledge of methods being developed in this country and they may change as new developments progress.

Look Good — Most of the new processes and the combinations appear promising as methods for conserving diamond bort for shaping and finishing sintered carbide and for performing operations on other hard-to-machine materials for important military end use items. Performance and costs for these new processes are not well established.

Electrolytic process appears very promising as a means for flat off hand grinding as applied to sharpening of single point tools. Since this application is the largest single consumer of diamond bort, the rapid development of this process for sharpening of single point tools offers possibilities for substantial relief of diamond bort. There are many thousand diamond wheel grinders used for sharpening single point tools, and it would be necessary to bring in or convert at least thousands of machines to show any appreciable effect. Additional experimental work must be completed before these machines are ready for mass production.

Second most prolific consumer of diamond bort is the grinding of single point tool chip breakers. The ultrasonic technique appears to be adaptable for this purpose. Additional experimental work is neces-

Strictly for Profit

CHOOSE CLARK

Solely on the basis of *benefit to your business* take a thoughtful look at the Five Factors of Profit built into Clark machines:

1. **TIME PROFIT**—Materials move faster, and in synchronized flow. Man-hours for loading and unloading are reduced drastically.
2. **SPACE PROFIT**—Idle space becomes profitable storage capacity.
3. **TURN-OVER PROFIT**—Speeding up the production cycle improves the inventory picture, conserves working capital.
4. **MANPOWER PROFIT**—Human productivity is sharply increased to offset shrinking manpower. Workers prefer the better jobs.
5. **SERVICE PROFIT**—Prompt, efficient service, provided by Clark's nationwide organization. *Keeps equipment working.*

Any way you look at it, your Clark investment gets you a solid, profitable "most for your money."

There's a most profitable time to look into it—RIGHT NOW! All the literature items are designed for your profit. Please use the coupon to order them.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS
AND POWERED HAND TRUCKS · INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIVISION • CLARK EQUIPMENT COMPANY • BATTLE CREEK 26, MICHIGAN

Please send: ☐ Movie Digest ☐ Safety Saves ☐ Basic Facts ☐ Material Handling News

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Firm Name_____

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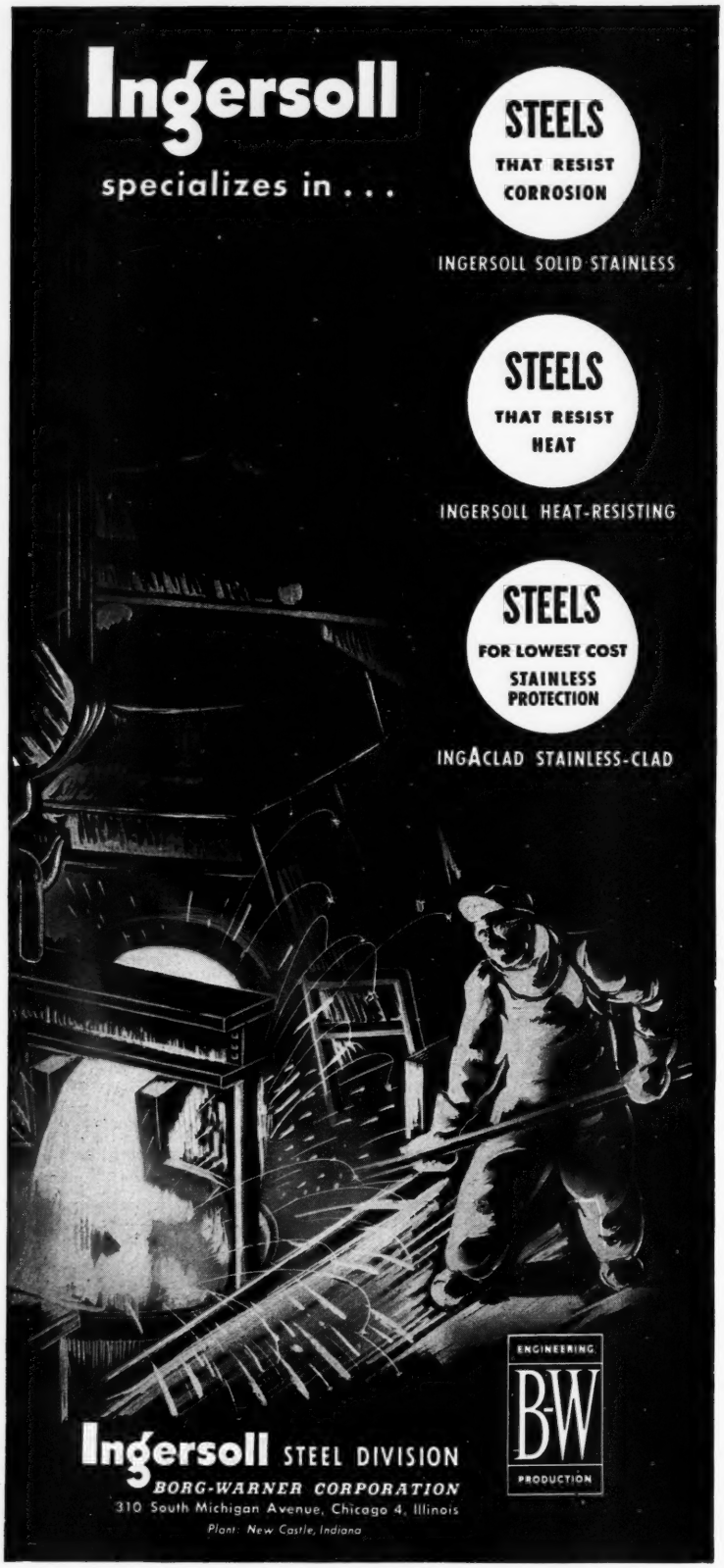
City_____ Zone____ State_____

AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN PRINCIPAL LOCATIONS



sary to properly appraise the method.

Sharpening of milling cutters and broaches and the grinding of projectile cores account for a substantial consumption of diamond bort. The electrolytic, electrosparking, ultrasonic processes, and combinations of them, look like possibilities for these applications; but experimental programs in these various fields have yet to be started.

Developments Needed—On the forming of cemented carbide turbine bucket attachments and machining and grinding of titanium compressor disks, no commercial methods are established and it may be necessary to develop some of the new processes at a rapid rate to meet the demands of possible increased production for the military. The electrosparking and ultrasonic processes appear applicable for forming turbine bucket attachments and rifling gun barrels, the electrolytic process appears promising for machining and grinding of compressor disks.

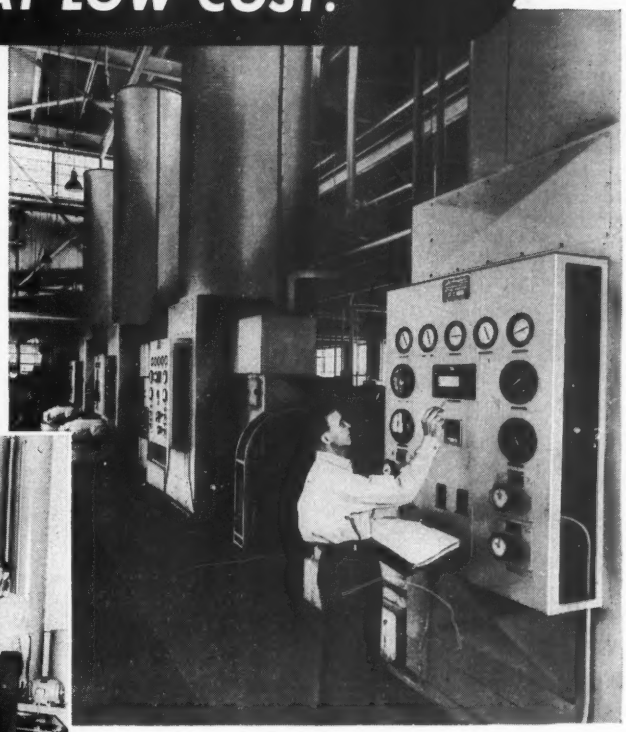
None of the new processes are in actual commercial use except for shaping and finishing dies. A limited number of machines, based on these new processes, are becoming available for practical test work. For producing tools such as single point tools, chip breakers, milling cutters and broaches, it will be necessary to carry the development work on these new processes through fairly extensive performance tests.

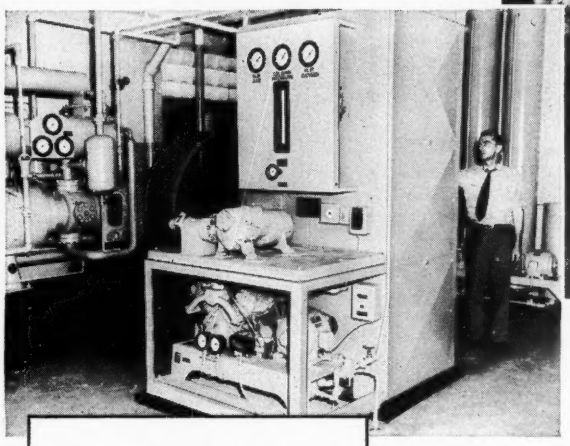
These tests should not only be made on the machines but also on the tools themselves in order to adequately establish them as production units. At the same time research and development on machine improvements and on learning more fundamentals should proceed in a more intensified manner. The performance tests might best be done in production shops and eventually they must be done there. However, it may be worthwhile to design special programs for accelerated performance tests to exploit the methods as rapidly as possible. Performance tests and other research and development should be carried out mainly by industry who have the real need for these new processes.

MAKE YOUR OWN OXYGEN and NITROGEN FROM AIR -- AT LOW COST!

Could You Use Large Quantities of Low-Cost Oxygen or Nitrogen?

If so, it will pay you to install an Air Products Generator and make your own. Numerous models are available with oxygen capacities from 200 cubic feet to 500,000 cubic feet per hour. *All of them have been proven by the acid test of operation in industry.*





ABOVE: Air Products Oxygen Generators in customer's plant. Capacity, 25,000,000 cubic feet per month.

LEFT: R-Series Air Products Oxygen Generator in customer's plant. Capacity, 500,000 cubic feet per month.

A Partial List of Users

American Chain & Cable Co., Inc.
Bethlehem Steel Co.
Thomas A. Edison, Inc.
Ford Motor Company
Granite City Steel Co.
Grede Foundries, Inc.
Hartford Hospital
Libby-Owens-Ford Glass Co.
Pettibone Mulliken Corp.
Pittsburgh Steel Foundry Corp.
Ross-Meehan Foundries
U. S. Armed Services

Noted for economy, dependability, and ease of operation, Air Products Generators employ the most advanced cycles, according to individual requirements.

Air Products, Incorporated, is a pioneer in the design and manufacture of oxygen-nitrogen generators and related equipment. A thoroughly experienced organization of over 500 people is occupied exclusively in this work. The overall background of Air Products in this field is unmatched by any other concern.

Air Products Generators have been in constant use for many years in the plants of nationally known companies. Some of these are listed at left. Air Products has effected substantial savings for all customers by eliminating the heavy costs, uncertainties and inconveniences of relying on outside sources.

We offer you experience based on the design and construction of over 400 successful oxygen-nitrogen generators.

Specialists in Equipment for All Low-Temperature Processes

Air Products OXYGEN—NITROGEN—ARGON **Generators**

AIR PRODUCTS, Inc., Dept. N, Box 538, Allentown, Pa.

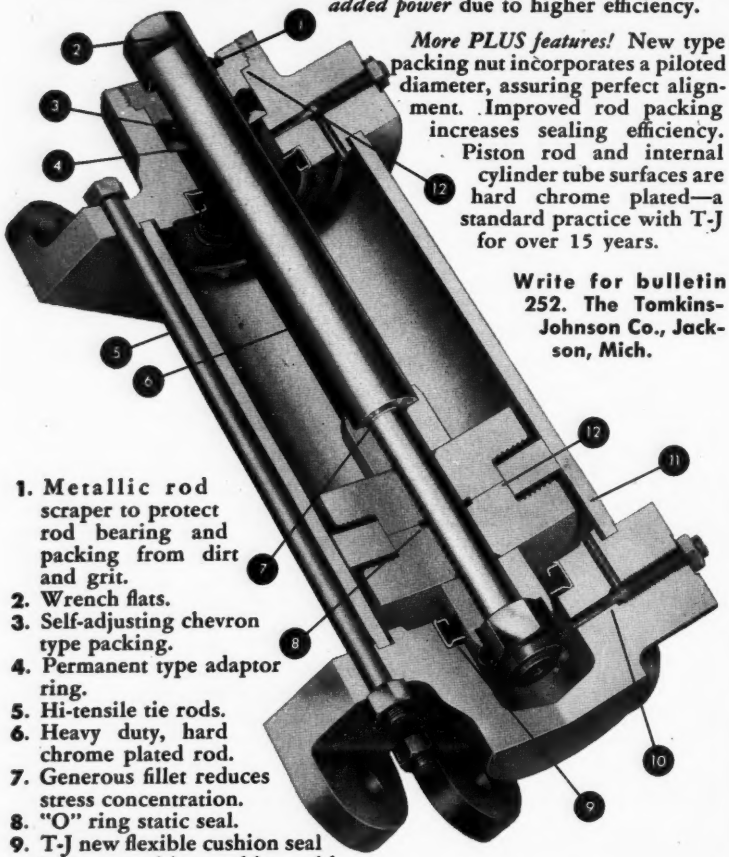
New Flexible Sealing...

T-J AIR CYLINDER

Designed with revolutionary application of

Super-Cushion

It's *sealed with pressure*—a revolutionary T-J application of flexible sealing that insures positive cushion action combined with automatic valving action for fast return stroke . . . eliminates binding and sticking . . . operates with *low friction, minimum wear,* and *added power* due to higher efficiency.



More PLUS features! New type packing nut incorporates a piloted diameter, assuring perfect alignment. Improved rod packing increases sealing efficiency. Piston rod and internal cylinder tube surfaces are hard chrome plated—a standard practice with T-J for over 15 years.

Write for bulletin 252. The Tomkins-Johnson Co., Jackson, Mich.

1. Metallic rod scraper to protect rod bearing and packing from dirt and grit.
2. Wrench flats.
3. Self-adjusting chevron type packing.
4. Permanent type adaptor ring.
5. Hi-tensile tie rods.
6. Heavy duty, hard chrome plated rod.
7. Generous fillet reduces stress concentration.
8. "O" ring static seal.
9. T-J new flexible cushion seal insures positive cushion with automatic valve action for fast return stroke. (Patent applied for)
10. Fine cushion adjustment.
11. Heavy wall precision honed hard chrome plate.
12. Controlled packing compression with metal to metal contact.

36 YEARS' EXPERIENCE T-J

TOMKINS-JOHNSON

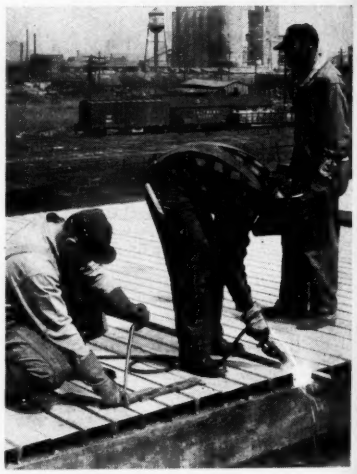
RIVITORS...AIR AND HYDRAULIC CYLINDERS...CUTTERS...CLINCHORS

Adhesive Bonds Lap Joints

Adhesive strong enough to make lap joints in aluminum alloy sheets for airplane construction is announced by Ciba Co. Inc., Kimberton, Pa. Tests show new adhesives, in some instances, have full strength of the Alclad aluminum. Company reports strength in shear is comparable to spot welding and riveting, and sometimes higher.

Adhesives tested by the manufacturer are its Araldite resins. These consist of variations of a new group of ethoxylene oxides with acid anhydrides, amines and other compounds as hardening agents. All the resins are thermosetting compounds that cure without evolution of water or volatile matter at room or elevated temperatures. General result is an adhesive of high resistance to acids and alkalies. Use of this resin adhesive class solves many problems that were previously difficult, e.g., bonding metallic materials to nonmetallics and unlike metals to each other.

Shear tests are made on a Baldwin-Sonntag 12-H hydraulic testing machine with 12,000-pound ca-



Steel Deck: A Good Ratio

Trend to one-story industrial structures in the past decade has caused an appreciable increase in use of steel roof deck. High strength-weight ratio, weatherability and installation ease are a few of the reasons. Here, workmen install Iri-Rib deck made by Wheeling Corrugating Co., Wheeling, W. Va. Reported average weight per square foot of roof is 3 pounds

LEWIS ROLLS . . . . . are designed for precision production

"X" and "XA"

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CLIMAX and AJAX ROLLS

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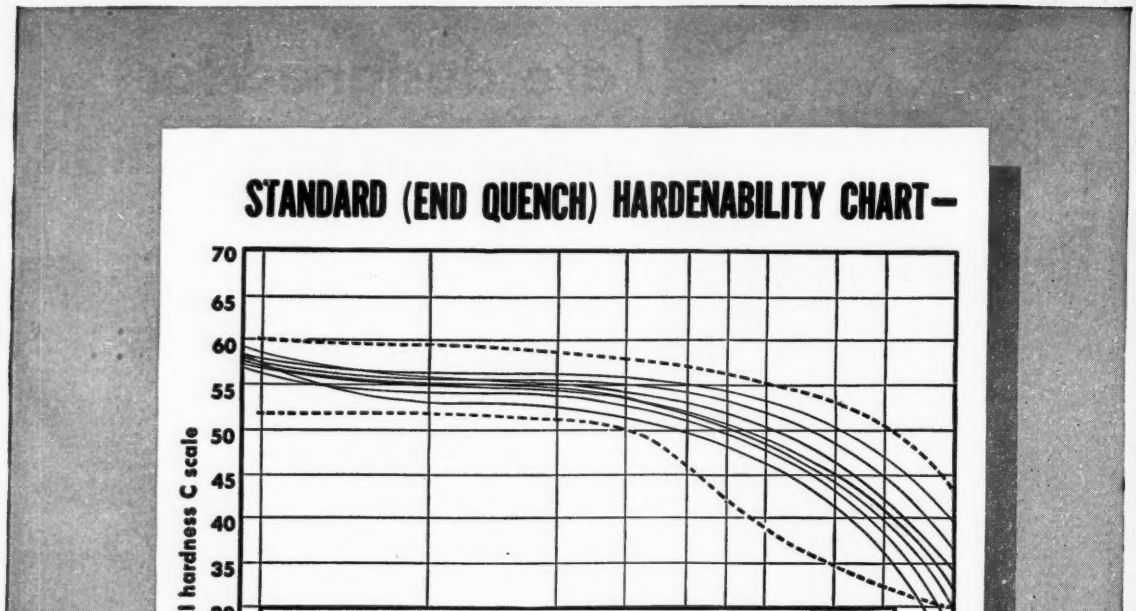
The mark of the PERFECT ROLL

MANUFACTURERS OF ROLLS AND ROLLING MILL EQUIPMENT FOR THE IRON, STEEL AND NON-FERROUS INDUSTRIES

LEWIS FOUNDRY AND MACHINE DIVISION OF BLAW-KNOX COMPANY • PITTSBURGH, PA



Consistent Hardenability obtained in Boron Steels made with GRAINAL ALLOYS

The most common test for boron steels is measurement of hardenability by the end quench or Jominy hardenability test. Today's steel substitutions are made on the basis of similar hardenability since a reasonable prediction can thus be made of the hardness and strength of a given part.

The curves above show the relationship between the hardenability of a series of seven heats of 81B40 steel and the hardenability band for 4140H steel, which it often replaces. The 81B40 heats were made in one electric furnace shop, and the remarkably consistent hardenability shown by the curves was obtained by the use of Grainal alloy as the means of adding the boron.

Consistent hardenability means consistent strength and hardness after heat treatment, which is the aim of every fabricator. The best proof that the Grainal alloys insure this objective is found in the successful use of three million tons of Grainal-treated steels.

VANADIUM CORPORATION OF AMERICA
420 LEXINGTON AVENUE, NEW YORK 17, N. Y. • DETROIT • CHICAGO • CLEVELAND • PITTSBURGH

MAKERS OF ALLOYS
VANCORAM
CHEMICALS AND METALS

pacity. Test specimens consist of two 1-inch strips of 16-gage Alclad aluminum bonded together with a ½-inch overlap to form strips 11½ inches long. Tensile loads as high as 2500 pounds have been applied on one-half square inch bond before failure in shear.

In preparation for tests, adhesive is applied to the 5-inch edge of two 5 x 6-inch sheets of 16-gage Alclad. Several pairs of these sheets are overlapped on these edges in a jig that assures a ½-inch overlap without measurement. A clamp is then placed on the jig to hold the several adhered surfaces tightly together. Next, the entire assembly is heated in an oven to set the adhesive. After removal from the oven, four test specimens 11½ inches long and 1 inch wide are sawed out of each pair of sheets.

Airstrips in Industry

Steel matting is used on an unfinished ground floor in the American Cyanamid's Willow Island, W. Va., plant. Matting is the same as is used on emergency airstrips.

Fork trucks bogged down in the ground in this building. The matting was laid and is used as temporary flooring.

Punch Presses Pressed Metal

Powdered iron cores are compressed on a Stokes R-4 eccentric-cam punch press at the Lenkurt Electric Co., San Carlos, Calif. Press is made by the F. J. Stokes Machine Co., Philadelphia.

Pressure is applied from above and below simultaneously assuring a high, uniform density. Production on some parts is 800 per cent of previous rates.

West Coast Facilities Shown

Expanded West Coast production and sales facilities of Allegheny Ludlum Steel Corp. are illustrated and described in a bulletin published by the company. The eight-page brochure records data on equipment and reviews types, sizes and materials produced at the Los Angeles forge plant. Also listed is the range of stock available at tool steel warehouses in

CUT OUR WAY
CAN'T TH' FATHEADS TELL HE'S JUST PICKING UP A PAIR OF CALIPERS OR SUMP'N? WHY, IF HE WAS CAUGHT IN TH' MACHINE, IT WOULDN'T PULL HIM OVER, CUZ IT TURNS THIS WAY!
WELL, MAYBE THEY THINK HE WENT THRU UNDER IT ONCE--BUT THEY OUGHT TO REMEMBER SOL-SPEEDI-DRI HAS STOPPED SLIPPIN' ACCIDENTS HERE!
THE MINUTE MEN
J.R.WILLIAMS
You can't go wrong buying the sales leader!
SOL·SPEEDI·DRI
SPEEDI-DRI CORP.,
WHEN YOU BUY, BE SURE IT'S
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OIL & GREASE ABSORBENT
FREE SAMPLE: Fill out the coupon and mail today for free sample and literature.
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Address
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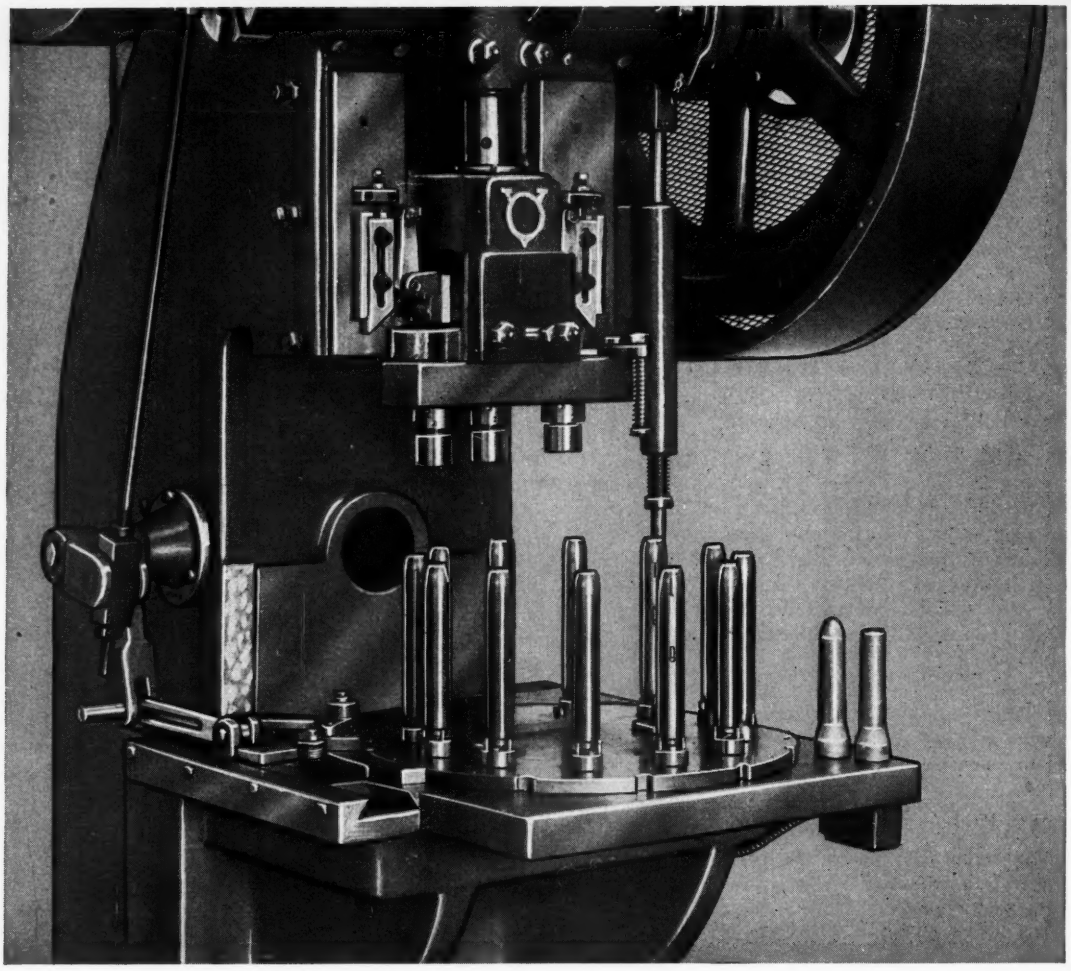
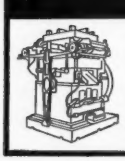
300% More Production



This Production Increase was obtained by the Blake Manufacturing Company, Clinton, Mass., on a pointing operation on flashlight cases. Under the old method, Blake employed two presses and two operators for this job. Pieces completed by the two men averaged 32 per minute, or 16 per man. With the V & O Dial Feed, one man operating one press produces 48 per minute, for an increase of 300% in per press production. It was also possible to add a third operation to improve the finish of the case and reduce rejects.

The Dial Feed designed and built for this manufacturer is typical of the tooling available at V & O. More and more manufacturers have come to realize that automatic feeds of the dial type boost production rates, conserve manpower and greatly simplify operator motions. V & O does the complete job for you on Dial Feeds, from initial design through manufacture. You get a complete package.

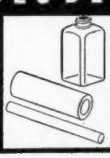
OTHER EMHART PRODUCTS INCLUDE:



HIGH SPEED AUTOMATIC PRESSES
HENRY & WRIGHT
Division of Emhart Mfg. Co.
HARTFORD 5, CONNECTICUT

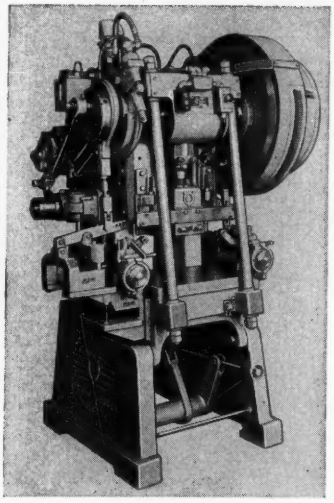
GLASS MAKING MACHINES
HARTFORD-EMPIRE CO.
Division of Emhart Mfg. Co.
HARTFORD 2, CONNECTICUT

AUTOMATIC PACKAGING EQUIPMENT
STANDARD-KNAPP
Division of Emhart Mfg. Co.
PORTLAND, CONNECTICUT



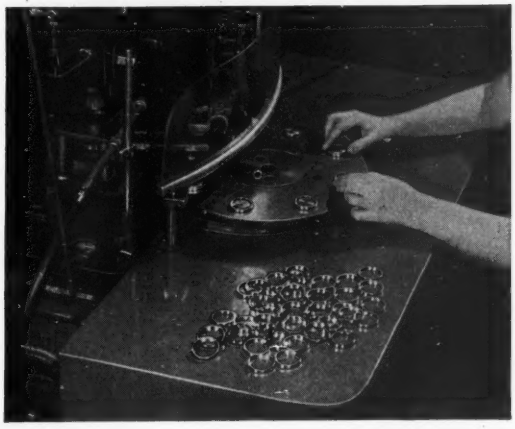
PLASTIC BOTTLES, RODS, TUBES, SPECIAL SHAPES
PLAX CORPORATION
Subsidiary of Emhart Mfg. Co.
HARTFORD 1, CONNECTICUT

Per Press *with V&O Dial Feed*



V & O High Speed Precision Presses with air clutch are available for high speed stamping operations. Machines are designed for maximum rigidity and minimum vibration. They have the traditional V & O long slide and fine machine tool workmanship, plus such added advantages as heavier over-all weight, more bed area, wider and heavier flanged slide, and numerous other advanced features.

Assembly of Roller Chain (type C-2060) is accomplished on this battery of V & O Presses at Baldwin-Duckworth Division, Chain Belt Co., Springfield, Mass. Machines in this group are 10-ton capacity. A 50-ton V & O Press (not shown), with an automatic coil feed, is used to blank #50 roller link plates.



Over 400% Increase in production on a secondary die operation resulted when a V & O Feed-O-Matic® was installed by Eclipse Pioneer Plant, Division of Bendix Corporation, Teterboro, N. J. Use of this power press feeder cut the time required for each piece from .210 of a minute to .046 of a minute—a saving of .164 of a minute per piece.

Only the best is good enough

DESCRIPTIVE CATALOGS Catalogs containing complete specifications and operating details on V & O Precision Power Presses and Feeds are available. Please write The V & O Press Company, 381 Union Turnpike, Hudson, N. Y.

THE V & O PRESS COMPANY
Division of Emhart Mfg. Co.
BUILDERS OF PRECISION POWER PRESSES AND FEEDS SINCE 1889
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DIE-LESS DUPLICATING

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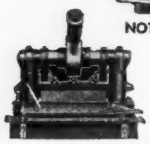
An unusually wide variety of both simple and intricate parts can be precision made by "DIE-LESS DUPLICATING" with individual or combined application of DI-ACRO precision Machines (see examples at right.) DI-ACRO Machines are made in 6 types and 21 sizes, including a new power driven Shear and a new hydraulic Bender.

BENDERS

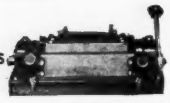
PUNCHES

ROD PARTERS

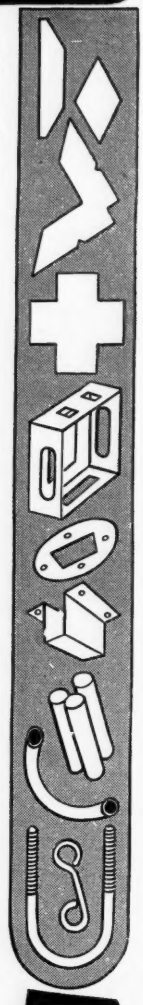
NOTCHERS



SHEARS



BRAKES



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Los Angeles and San Francisco. Sales and engineering forces in both these cities and Seattle occupy expanded quarters. Bulletin is available from the company, Oliver Bldg., Pittsburgh 22.

Cement Insulates Baking Vats

Baking a protective interior coating on big industrial vats is made safe and economical by vermiculite high temperature cement. So says F. R. Killam, president of Industrial Coatings Ltd., Vancouver, B. C. The cement, a product of Zonolite Co., Chicago, is blown on the outside of vats treated at the Vancouver plant, where the system was developed.

This insulation method has cut fuel costs and reduced baking time, says Killam. Vermiculite is incombustible, minimizing fire hazards. A 3/8-inch layer is blown on the outside of vats from a gun. Then the first coat of protective phenolic resin is put on the inside. In the next step, raw flame is applied to the interior with a specially-designed propane gas burner. As the phenolic resin is baked, the cement dries.

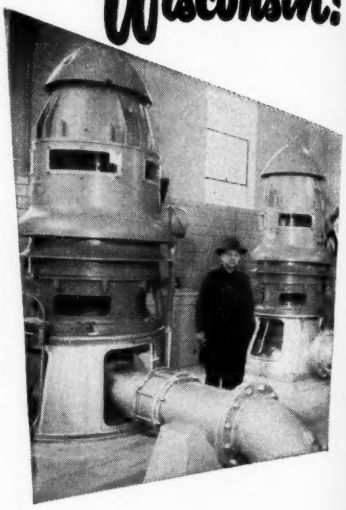
Final coat of insulating cement, of same thickness, is then sprayed on and another interior resin coating applied. Each inside coating job takes six hours and there may be as many as 10 separate bakings.

Temperatures range from 350 to 500°F. Without insulation, this would be almost impossible to maintain. Large vats range in size from 8 to 20 feet diameter and 20 to 40 feet long. If they were not insulated, the heat radiation from such large metal areas would prevent building up proper heat levels.

Charts Cover Casting Materials

Revised reference charts covering carbon, alloy and stainless steel casting materials are offered by Lebanon Steel Foundry. Charts give specification designations, analyses, physical properties and heat treatments for 32 standard casting materials. One chart includes corrosion and heat resistant alloys; the other, carbon and low alloys. Both will be sent upon

ONE OF THE Finest In *Wisconsin!



*** for the city of wauwatosa**

Layne points with pride to a recent deep well and four vertical turbine pump installation for the city of Wauwatosa, Wisconsin. From an overall capacity, control flexibility, high efficiency, smoothness of operation and modern engineering, this is one of the very finest water supply plants in the state. The 1750 foot deep well, cement grouted from top to bottom, produces 1650 gallons of water per minute against a dynamic head of 145 feet. All water for the city of Wauwatosa is 100 percent from Layne pumps.

This installation is typical of Layne's all inclusive services. Everything from the original test borings to the well drilling, sand screen and pumps and motors, was handled complete by Layne's own crews operating under the direct supervision of Layne engineers. It is such splendid services and outstanding results that Layne and Layne alone in the Nation is in a position to offer cities, factories, mills and plants of all kinds whether the need is for a single-unit or for many. For late catalogs, bulletins etc., address

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WATER WELLS

VERTICAL TURBINE PUMPS

WATER TREATMENT

The hard, cold facts about Pittsburgh's hot furnaces!

47 PLANTS OKAY THE HEAT PROVER

Pittsburgh's great steel industry needed an instrument to measure air infiltration, to check air requirement and fuel-air ratio controls in open-hearth furnaces . . . an instrument to check the stoves in which blast-furnace air is heated . . . to check precise atmospheres in soaking pits . . . to control fuel waste and precise atmospheres in processing furnaces.

THE CITIES SERVICE HEAT PROVER WAS THE ANSWER . . . and it received the stamp of approval from engineers in 47 different mills in and around Pittsburgh!

Cities Service Heat Provers . . . *not an instrument you buy, but a service we supply* . . . helped to boost furnace productivity through these five unique advantages:

1. Rapid continuous sampling.

2. Simultaneous reading of oxygen and combustibles.

3. Direct measurement of oxygen and combustibles.

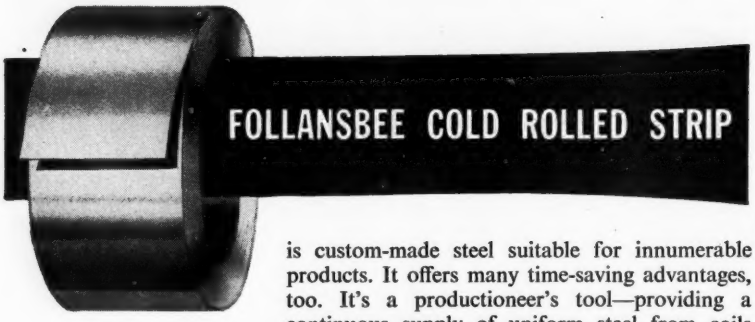
4. Easy portability.

5. No maintenance; no re-calibration.

These points begin to tell you why Cities Service Heat Prover analyses are just as much favored in glass, ceramics, steam generation and other fields as in the great Pittsburgh steel area. For the full story as it applies to you, write CITIES SERVICE OIL COMPANY, Dept. D24, Sixty Wall Tower, New York City 5.

CITIES SERVICE

typewriters tables & time-saving



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request to the company's Dept. B1, Lebanon, Pa.

M.I.T. Plans Spectroscopy Study

Special program in infrared spectroscopy is scheduled June 16-27 during the 1952 summer session at Massachusetts Institute of Technology. Program, offered jointly by the spectroscopy laboratory and department of chemistry, is designed to introduce infrared instrumentation and laboratory methods to those interested in the use of infrared spectra in the solution of chemical problems.

Session will consist of two integrated one-week courses on techniques of infrared spectroscopy and applications of infrared spectroscopy. Directors are Dr. Richard C. Lord, director of the spectroscopy laboratory at M.I.T., and Dr. Foil A. Miller, in charge of the spectroscopy laboratory at Mellon Institute of Industrial Research.

Morning lectures in the first course will be devoted to elementary theory of infrared spectra, a survey of infrared instrumentation and discussion of techniques for measurement of spectra. Afternoon laboratory exercises will be carried out by small groups with a variety of infrared instruments and related equipment.

Second course will cover theory of infrared absorption by molecules, interpretation of infrared absorption spectra and relation between spectra and molecular structure.

Requests for enrollment application should be addressed to the institute, in care of Dr. Ernest H. Huntress, Cambridge 39, Mass.

Kit Holds J.I.C. Hydraulic Key

Handy kit, that gives a quick and complete key to all standard Joint Industry Conference symbols for industrial hydraulics, is offered by Denison Engineering Co. For those working in hydraulic designing, engineering or circuit application, the kit provides easy reference and work-saving adaptation to circuit diagrams by simplifying planning. It makes diagrams easier to read or draw, saving time wherever JIC symbols are used.

Kit is made of two units—plastic drawing template containing basic

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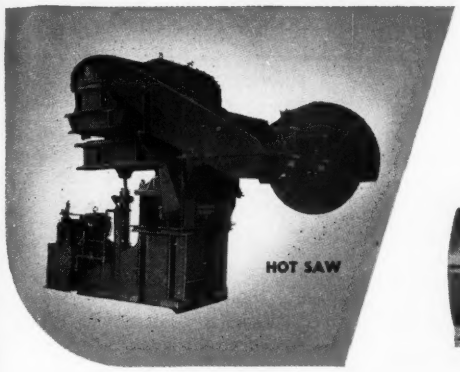
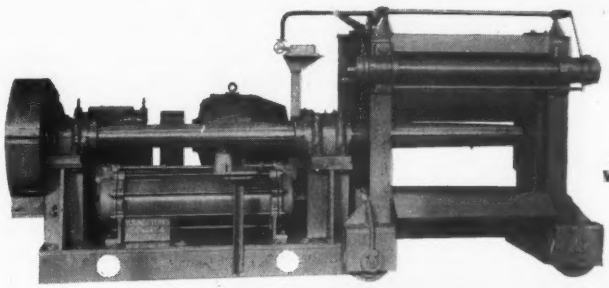


HOT SAW



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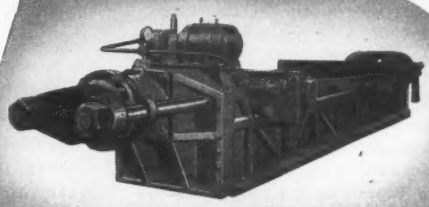

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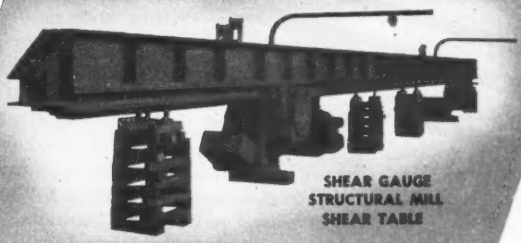

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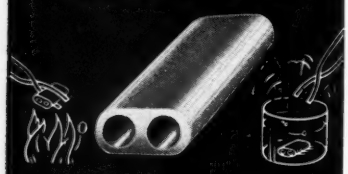

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Available only through GORDON, Serv-rite Thermocouple Insulators are made to stand the gaff of excessive thermal shock far above normal requirements.

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Serv-rite Thermocouple Insulators — in any type or size — can be supplied immediately from Gordon's large stocks in the Chicago and Cleveland plants. Remember — you can always distinguish Serv-rite Insulators by their tan color.

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elements of JIC symbols, and a 32-page booklet showing key examples of circuit components by approved symbols.

Circuit guides can be obtained free by making requests on company letterhead to the manufacturer, Columbus, O.

Mechanical Hand Feeds Press

Production - boosting device shown at American Society of Tool Engineers' exposition is a punch press feeder that functions as a mechanical hand. Tool is designed to lessen fatigue of power press operators while increasing number of parts they can produce. Instead of feeding parts to the press directly by hand, operators place them in nests on a small rotating dial. Mechanical hand then goes into action, picking up one part at a time and feeding it into the press.

Manufacturer, V & O Press Co., division of Emhart Mfg. Co., Hudson, N. Y., says companies using its mechanical feeder report increases in production from 50 to 400 per cent. Basic advantage is that operators can concentrate on placing parts on the dial without worrying about co-ordinating their action with the press. Operators thus can handle a greater number of parts with simpler, less fatiguing motions.

The company also reports it anticipates more efficient profile-grinding of critical machine tools through application of an improved type of Swedish machine. Grinder will be manufactured in the U. S. by Henry & Wright Division, Hartford, Conn.

Improvements attributed to the grinder are ability to make deep cuts without vibration and precise control over the pattern to follow in grinding tools to desired contours. A pantograph system is used, but it is mounted on machine's frame rather than on the grinding wheel. Template guides the pantograph in reproducing required contours.

Ballizing Bulletin Published

Ballizing process for high-speed, precision hole sizing and finishing is described in a bulletin announced by Industrial Tectonics Inc. This

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☐ Shaped Wire*

— Flat
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Odd contour

Low or high carbon, stainless, special alloy, Armco. You draw the shape—PAGE can draw the wire.

☐ Armature Banding Wire

Tinned stainless or carbon steel. In reels of 50 to 200 pounds. Stainless has high tensile strength, high resistance, low permeability.

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Tough, durable, workable. In the size and type for your work.

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Any shape* . . . high carbon . . . hard drawn . . . high tensile . . . stainless . . . galvanized . . . tinned . . . bright.

*Cross-sectional areas up to .250" square; widths to ⅜"; width-to-thickness ratio not exceeding 6 to 1.

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Whatever your requirements in enclosed gear drives, you will find the one best suited to your needs in the complete Foote Bros. line.

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Bulletins are available on drives to meet every need. Check the ones you want on the coupon below.

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Economical in original cost and operation. Duti-Rated Gears have file-hard tooth surfaces and ductile cores, assuring long life. Double or triple reductions, with ratios from 5 to 1 up to 238 to 1 and capacity range from 1 up to 175 horsepower.

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A compact line of gearmotors in 17 sizes in single, double and triple reductions, incorporating Duti-Rated Gears that assure long wear life and maximum load-carrying capacity. Available with Louis Allis open drip-proof, splash-proof, enclosed and explosion-proof motors.

HYGRADE WORM GEAR DRIVES

Heavy duty drives with precision worm gearing that assures high efficiency and load-carrying capacity. Horizontal, vertical and Hytop (extended shaft) types. Ratios from 4⅛ to 1 up to 4108 to 1. Capacities up to 260 horsepower.

MAXI-POWER HELICAL GEAR DRIVES

Heavy-duty helical gear drives. Available in single reduction units, ratios up to 9.91 to 1; capacities up to 1550 horsepower; double-reduction units, ratios from 9.32 up to 71 to 1, capacities to 1100 horsepower; triple reduction units, ratios from 79 up to 360 to 1, capacities up to 420 horsepower.

WORM-HELICAL GEAR DRIVES

Heavy duty vertical drives with horizontal input shafts and vertical output shafts—up or down. Ratios from approximately 25 to 285 to 1 and a capacity range up to 128 horsepower.

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Better Power Transmission Through Better Gears

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- ☐ Bulletin HGA Hygrade Worm Gear Drives
- ☐ Bulletin LPB Line-O-Power Straight Line Drives
- ☐ Bulletin MPB Maxi-Power Helical Gear Drives
- ☐ Bulletin GMA Foote Bros—Louis Allis Gearmotors
- ☐ Bulletin WHA Worm-Helical Gear Drives

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72 pages . . . illustrations and specifications on the most complete line of carbide cutting tools. Send for your copy today.

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process (sometimes known as ball broaching) consists of pressing a precision ball of suitable size and hardness through the unfinished hole. Process is used with holes produced by drawing, extruding, die casting, and machining operations. Hole size is held to plus-or-minus 0.0002-inch and burnished surface produced is practically free from roughness.

Bulletin outlines production and cost advantages and limitations of ballizing, and describes mechanics of the process regarding size control and work-hardening effect. It covers factors involved and procedure to follow in determining required ball size and discusses relative advantages of alloy steel and tungsten carbide balls under various production conditions.

Copies are available from Industrial Tectonics Inc., 3684 Jackson Rd., Ann Arbor, Mich.

Badges Made in 90 Seconds

Portable, low-cost badge fabricating tool produces identification badges in 90 seconds. Using the Polaroid Land camera, the kit includes a simple photo trimmer, lighting, camera and carrying equipment.

Badges can be furnished in a variety of colors and with pin or clip-type fasteners. Pictures are made in duplicate, one for the badge and one for personnel file. Photo trimmer cuts the picture to fit lightweight metal badge. System was developed by Anderson & Sons Inc., Westfield, Mass.

Gas Cutting Torch Explained

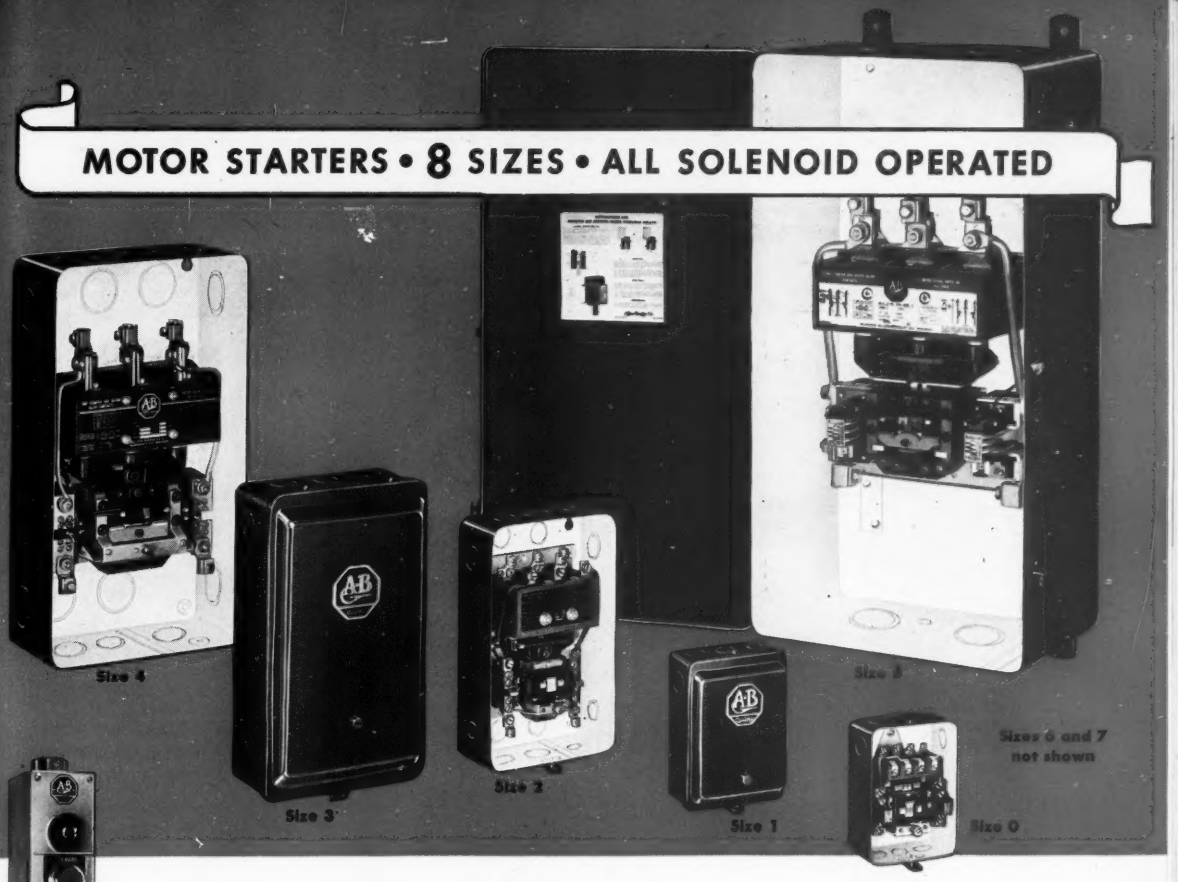
Compilation of current information on the new Browning gasoline hand cutting torch is available from the national distributor of Browning products, Steel News Industries.

"File Facts" explains all pertinent operating phases of the torch. Copies of the booklet can be obtained by writing Steel News Industries Inc., Canonsburg, Pa.

Duster Demand Grows

Agricultural sprayers and dusters are expected to be in continued strong demand in 1952. H. F. Brandt, chairman of the markets committee, National Sprayer & Duster Association says barring

MOTOR STARTERS • 8 SIZES • ALL SOLENOID OPERATED



COMPLETE LINE OF OILTIGHT ACCESSORIES

Allen-Bradley oiltight push buttons and accessories are available for single and multiple controls in all forms, including pendent types for machine tool drives. Oiltight gaskets seal the switch mechanism against oil seepage around push buttons and covers.

There are pilot lights, selector switches, stop and start push buttons, limit switches, and many other varieties of controls in the standard Allen-Bradley line to meet every machine tool requirement.

Automatic Starters That Satisfy All Machine Tool Applications

Machine tool speeds are being steadily increased—machining operations are demanding greater and greater precision in motor control performance. These simple facts explain why Allen-Bradley solenoid motor controls . . . with only one moving part . . . are so popular with machine tool builders. In the complete line from Size 0 to Size 7, the same trouble free solenoid principle is used. There are no clapper switches . . . hence, no change in performance . . . no loss of compactness . . . no drop in dependability.

This basic design simplicity accounts for the supreme popularity of Allen-Bradley controls. The A-B trademark is a sales asset on any machine. May we send you our Handy Catalog?

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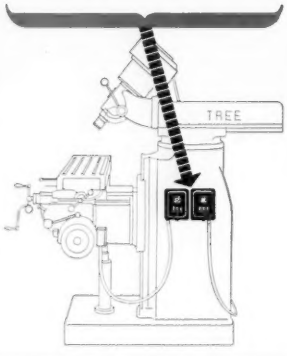
SOLENOID STARTERS

QUALITY

AVAILABLE IN *Three* HANDY FORMS

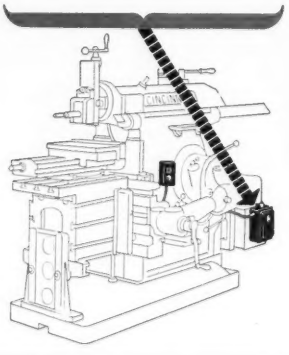
START-STOP BUTTONS in cover for 3-wire pilot control

FORM 1 with Start and Stop push buttons for machines where the starter can be located conveniently near the operator.



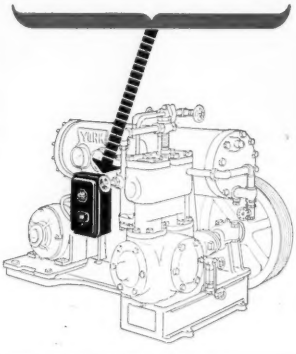
WITHOUT BUTTONS in cover for 2- or 3-wire pilot control

FORM 2 with plain cover for machines where starter must be operated by remote push buttons or limit switches.



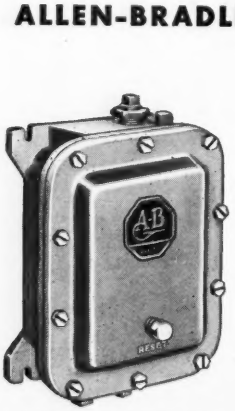
3-WAY SELECTOR SWITCH in cover for 2- or 3-wire pilot control

FORM 3 with Hand-Off-Auto 3-way selector switch for air conditioners, pumps, and other automatic machinery.



ALLEN-BRADLEY SOLENOID STARTERS

in Enclosures for Every Type of Industrial Service



Allen-Bradley starters are available in various standard NEMA type enclosures.

Machinery designers who realize the importance of selecting the right enclosure for each application are specifying Form 1 enclosures with Start and Stop push buttons for many machines, thus reducing the installation cost of control wiring. For machines requiring manual as well as automatic control, they use the handy Form 3 enclosure. All starters are available in a variety of NEMA type enclosures to meet any service requirement. For full information, let us send you the Allen-Bradley Handy Catalog.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wisconsin

A-B Quality

ALLEN-BRADLEY
SOLENOID STARTERS
QUALITY

2-52-MR

all out war, materials and availability of equipment should improve. He states that with little new land being brought into production, increased food supply will depend more and more on spraying and dusting.

MIT Offers Instrument Courses

Special one-week training courses in instrumental analysis will be offered from Aug. 18 to 22 and from Aug. 25 to 29 at Massachusetts Institute of Technology. Courses will enable chemists from industry to study the applications of new techniques and methods in the field of applied analytical chemistry.

First program will be devoted to electrical methods in instrumental analysis and will emphasize potentiometry, polarography, conductimetry, amperometric titrations, and applications of self-balancing recording potentiometers.

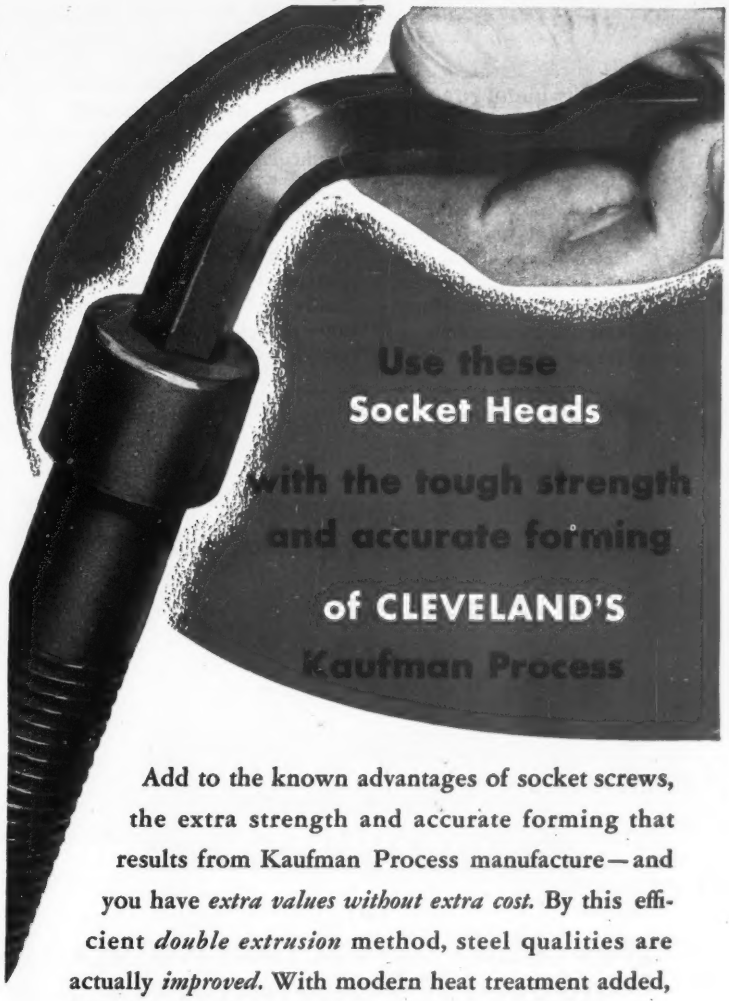
Second program will cover optical methods in instrumental analysis and will emphasize spectrophotometry, colorimetry, fluorimetry, turbidimetry, nephelometry, photometric titrations, and flame photometry. Requests for application and information should be addressed to Dr. Ernest H. Huntress, director of the summer session, Room 3-107, Massachusetts Institute of Technology, Cambridge 39, Mass.

Flame Limits of Gasses Listed

Comprehensive listing of the limits of flammability of 155 gases and vapors in air or oxygen is contained in a Bureau of Mines bulletin. Flammability limits are the upper and lower percentages of a gas or vapor which will form an explosive mixture with air or oxygen.

Bulletin explains how flammability limits are determined and some of the theoretical considerations taken into account in such experimentation. It also presents the results of a critical review of all figures published on the limits of flammability of combustible gases and vapors when mixed with air, oxygen, or other atmosphere.

Bureau of Mines bulletin 503, "Limits of Flammability of Gases and Vapors," can be obtained from the Superintendent of Documents,



Add to the known advantages of socket screws, the extra strength and accurate forming that results from Kaufman Process manufacture—and you have *extra values without extra cost.* By this efficient *double extrusion* method, steel qualities are actually *improved.* With modern heat treatment added, Cleveland Socket Screws are *extra tough.* And the true hex sockets, formed in one operation, are clean all the way to the bottom with sharp corners that give firm purchase to the key. It pays you to specify and buy Cleveland Socket Head Screws.

CLEVELAND *Top Quality* FASTENERS

THE CLEVELAND CAP SCREW COMPANY
2917 East 79th Street, Cleveland 4, Ohio
Warehouses: Chicago • Philadelphia • New York • Providence
originators of the Kaufman DOUBLE EXTRUSION Process

U. S. Government Printing Office, Washington 25, for 40 cents a copy.

Powder Smothers Metal Fires

Pressurized extinguisher designed to smother hazardous fires in metals is announced by the Ansul Chemical Co., Marinette, Wis. Expelling a dry powder known as Met-L-X, extinguisher is used against fires in magnesium, sodium, potassium, zinc, powdered aluminum and other metals.

Powder forms an air-excluding crust over the burner as it contacts the flames. It is moisture-repellent, free-flowing, nontoxic, noncorrosive and nonabrasive. It does not conduct electricity and will not deteriorate under normal conditions.

Insulation Tested

Recommended test procedures and practices using direct current insulation testing on high voltage electrical apparatus are announced by the John Hewson Co., New York. Originally published by Westinghouse Electric Corp. and Consolidated Edison Co. of New York, procedure determines actual condition of the insulation on all types of high voltage apparatus.

Planned maintenance is one of the benefits of the testing. Copies will be sent on request to the John Hewson Co., 106 Water St., New York 5.

Beta Ray Checks Roll Quality

Impregnated strip of rubberized cord racing from the calender rolls is continuously and automatically monitored by a beta ray gage. The device scans the moving sheets with beta rays emitted from a tiny source of Strontium 90. The amount of rays absorbed by the fabric gives an accurate indication of the material's weight per unit area. A deviation indicator on the instrument allows the calender operator to maintain the rubberized fabric at proper gage.

In the past it was necessary to cut small samples from the material as it emerged from the rolls. By the time these had been checked for weight and thickness, a large quantity of off-tolerance

Good for many years at hard labor

YORK·GILLESPIE

CUSTOM-BUILT MACHINERY

for

Steel Mills • Steel Fabricators
Industrial Manufacturers

Now is the time to modernize your industrial machinery. For never before has American industry encountered such a challenge! Its double job of producing for defense and civilian needs demands plant machinery built stronger, to last longer.

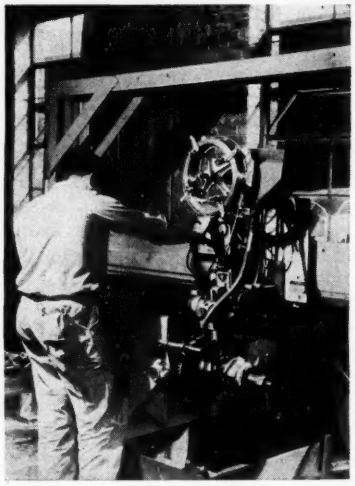
York-Gillespie Manufacturing Company — designers and custom-builders of special machinery — and York Engineering and Construction Company form an unbeatable team working to develop and build machinery to fit your production requirements.

From Your Own Blueprint or Our Design

Special machinery is created in our shops from your own design . . . or we will design and fabricate to solve your specific problem.

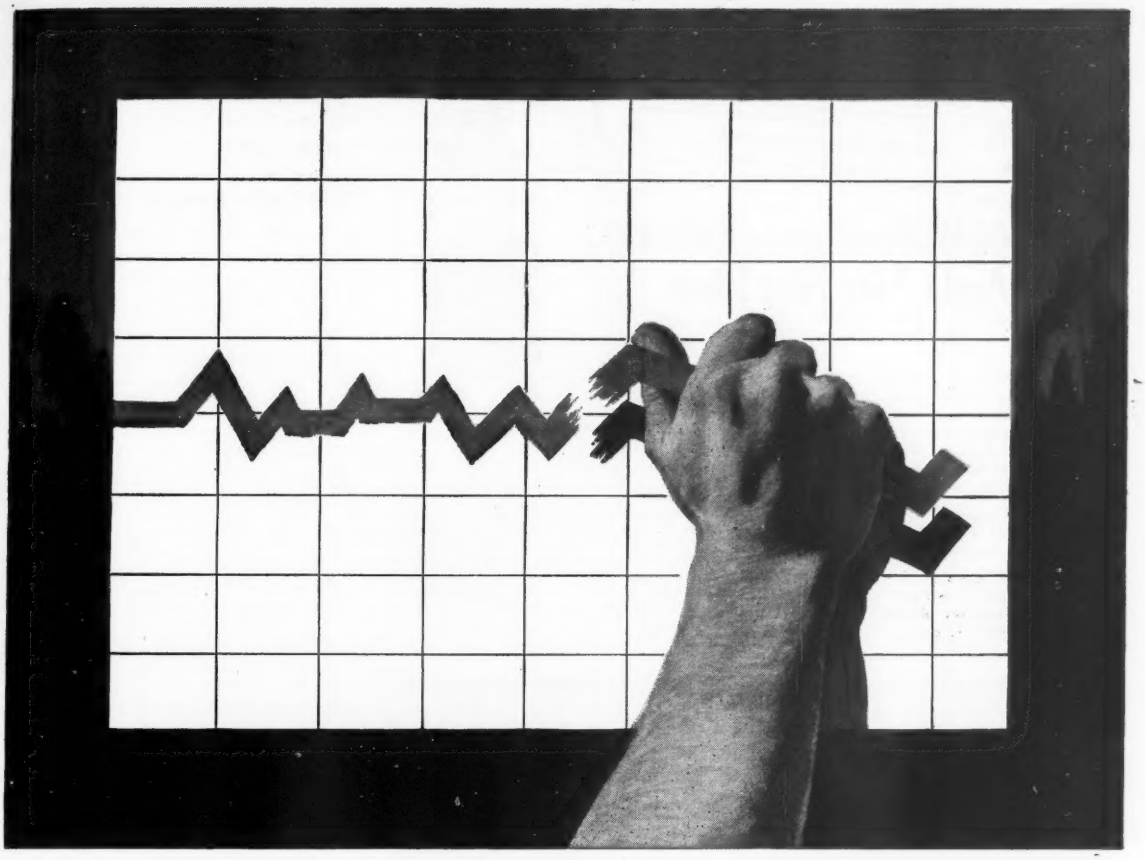
Send York-Gillespie your machinery specifications. Your inquiries will receive prompt attention.

YORK-GILLESPIE MANUFACTURING CO.
and
YORK ENGINEERING & CONSTRUCTION CO.
931 Penn Avenue, Pittsburgh 22, Pa.



Build-up in Nickel-Bronze

Deep defects in a nickel-bronze gear, revealed after final machining, are corrected by Linde Air Products Co.'s Heliarc welding. First, defective areas are chipped out. Then operator builds up chipped-out spots, using a ¼-inch rod cast from the same materials that were used to make up the original gear



How much tonnage does your down-time steal?

EXCESSIVE down-time for bottom repairs steals precious production time—time when your furnace should be making steel!

You can cut costly repairs, greatly increase your tonnage per year, when you install a bottom of Permanente 165 *periclase* ramming mix.

Bonded by means of crystal-bridging, patented Permanente 165 begins formation of a ceramic bond as low as 1500°F—gives a *deeper bond* at normal burn-in temperatures—with no formation of fluids.

Because Permanente 165 has an MgO content of more than 95% after burn-in, *higher refractoriness* is retained longer under operating conditions. *High density* is insured by accurately-sized, pre-shrunk periclase grains.

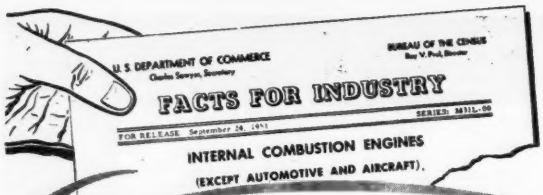
This means you get a better bottom that requires less time and materials for repair, with far less danger of costly breakthroughs.

YOUR Kaiser refractory engineer will give prompt attention to your refractory problem—will offer, where desired, research, design and installation service to give you maximum production most economically. Write for descriptive literature on Permanente 165 and on the companion ramming mix, Permanente 84. Principal sales offices: *Chemical Division*, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California. First National Tower, Akron 8, Ohio.

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Basic Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Alumina • Periclase

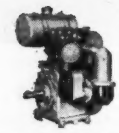

U. S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
FACTS FOR INDUSTRY
INTERNAL COMBUSTION ENGINES
(EXCEPT AUTOMOTIVE AND AIRCRAFT).

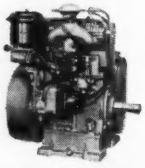
WISCONSIN *Air-Cooled* ENGINES
Again Take First Place

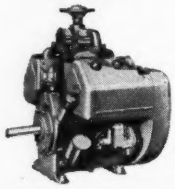
According to U. S. Census figures covering ALL carburetor type internal combustion engines, a total of 566,777 engines of 11 to 175 cu. inches displacement were produced and shipped by 41 different manufacturers to other companies during 1950. (This does not include automotive and aircraft engines or so-called "captive" engines built and incorporated into the equipment of the same company.)

Of the total of 566,777, Wisconsin Motor Corporation figures show that 206,737 were produced by this company, or 36.4% of the total in the specified H.P. range.

These figures are significant because they again offer outstanding proof of preference for Wisconsin Air-Cooled Engines by power equipment builders, distributors, dealers and users of power-operated machines and engines.


4-cycle single Cyl. models, 3 to 9 hp.


2-cylinder models 7 to 13 hp.


V-type 4-cylinder models 15 to 30 hp.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

A-7061-⅛AA

• Ruggedly made to withstand severe use . . . advanced designing in fan blades . . . rigidly mounted and securely locked in place . . . well balanced and readily portable by overhead crane or auxiliary truck. Stationary and oscillating types with either pedestal (floor mounting) or bracket (wall mounting).

B. F. Perkins & Son, Inc.
HOLYOKE, MASSACHUSETTS
Manufacturers of Industrial Machinery Since 1873

PERKINS
MAN COOLERS
TRADE MARK REGISTERED UNITED STATES PATENT OFFICE

material had been processed.

Unit is installed at the Armstrong Rubber Mfg. Co., Des Moines, Iowa. It is manufactured by the General Electric Co., Schenectady, N. Y.

Unit Copies Records

Copies of records, drawings, plans and other important documents can be made with the Portagraph of Remington Rand Inc., New York. The unit does not require a darkroom. Company says it copies anything regardless of paper, color of ink, pencil, crayon, type or printwork.

Booklet describing the unit can be secured by writing the company, 315 Fourth Ave., New York 10.

Cards Show Packing Plans

Packaging and shipping a multitude of spare parts in both large and small lots calls for efficient specification systems. Using many different types of containers and methods of closing, the Cleveland Tank Plant, Cadillac Division, General Motors Corp., has a specification card which is the core of their system.

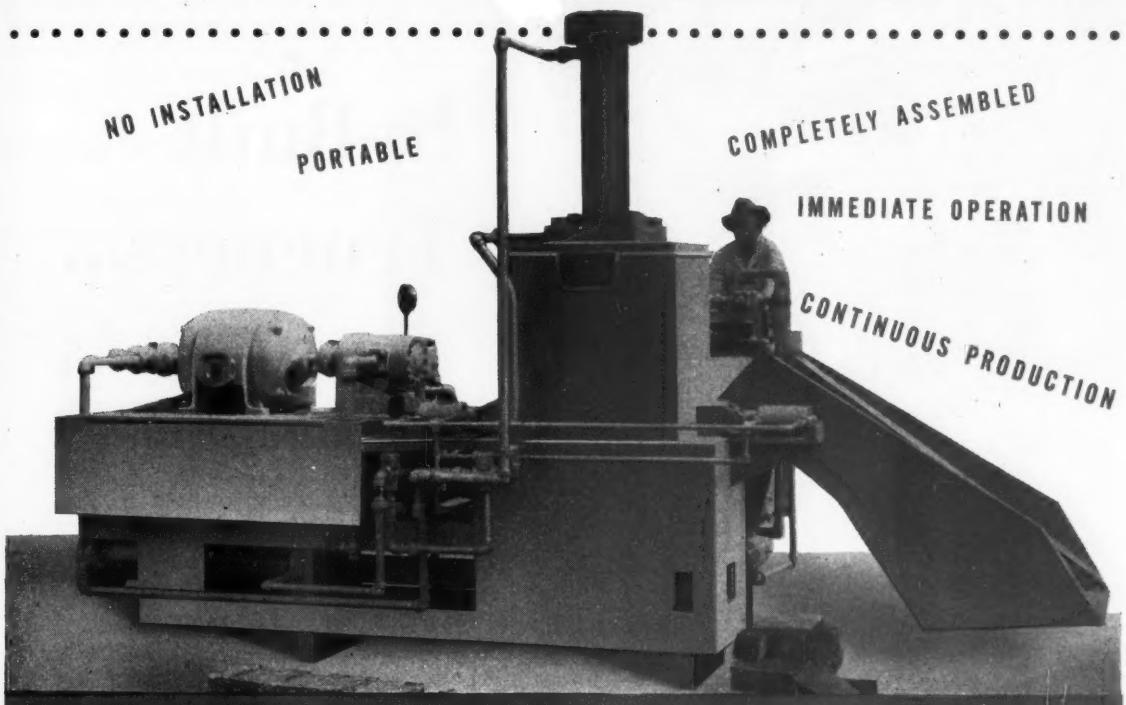
Information included on the card gives complete instructions for all stages of the packaging operation. Number of pieces per pack, type of water proofing, method of cleaning, type wrapping paper and method of crating are all detailed. Once this information is established for a particular part, it is standardized for all lots which follow.

Writing the specification cards for each spare part is the responsibility of the packaging engineering group. In addition, this group is responsible for the test and development of new materials and methods.

Stainless Properties Charted

Report on elevated-temperature properties of stainless steels offers a graphic summary of data issued by American Society of Testing Materials and American Society of Mechanical Engineers. Included are summary curves for tensile strength, 0.2 per cent offset yield strength, per cent elongation, per cent reduction of area, stresses for rupture in 100, 1000, 10,000

Harris Non-Ferrous Metals Baling Presses

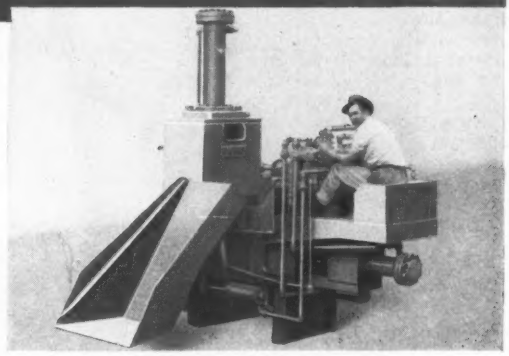


Bundle Size Attracts Dealers and Smelters

The HARRIS Non-Ferrous Metals Baling Presses were designed primarily for use in baling non-ferrous scrap. A particular feature of this design is that continuous baling is obtained, since the charging box is open while the bale is being made and ejected. The charging box is large enough to handle bulky material such as wire, sheets, etc. Pressures used make an exceptionally dense bale—approximately 40% density.

Dealers find these presses excellent also for baling sheet iron clippings and tin cans. The size and density of bundles are especially attractive for charging in electric furnaces.

The three models of this design provide an ample range to meet all requirements.



Size of Charging Box	33" x 33" x 24"
Average number of bales per hour	60 - 70
Size of Electric Motor	50-Hp. 1200 Rpm
Vickers Vane Type Rotary Pump	2,000 lbs. per sq. in.
Space Required	10' x 12'
Shipping Weight	20,000 lbs. (approx.)

AVERAGE SIZE OF FINISHED BALE

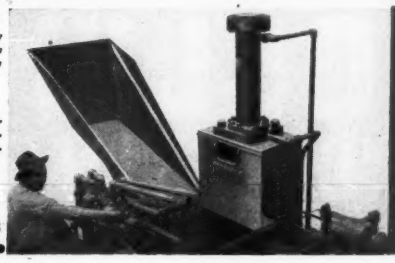
NF-40	5" x 5" x 15"
NF-50	5" x 7" x 15"
NF-80	8" x 8" x 15"

AVERAGE WEIGHT OF BALE

NF-40	40-60 lbs.
NF-50	50-70 lbs.
NF-80	80-100 lbs.

AVERAGE TONNAGE PER HOUR

NF-40 One and one-half tons
NF-50 Two tons
NF-80 Two and one-half tons



HARRIS FOUNDRY & MACHINE CO.

Reclamation Engineers Since 1889

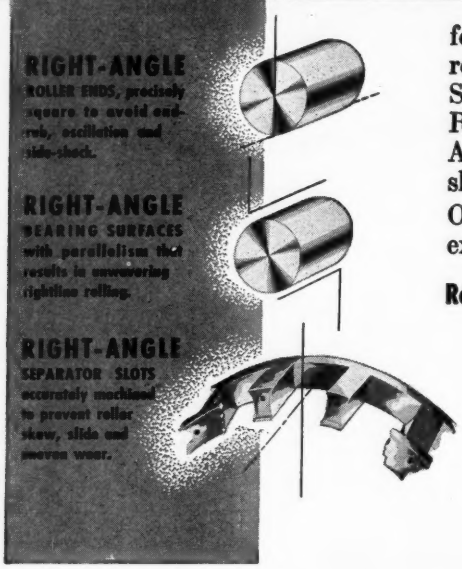
CORDELE, GEORGIA

In-Built Trueness...

basis for longer life and lower cost!

Unwavering right-line rotation . . . that's the immediate result of in-built trueness in Rollway roller bearings. There's no skew, no side-shock, no roller-end-drag. Internal forces are balanced by matchless precision in related parts. Bores are precisely cylindrical. Separator surfaces are rigorously parallel. Roller ends are truly square on every diameter. And bearing surfaces match both the separator slots and the roller races.

Over the long run, life expectancy is greatly extended. Cost per unit of time falls sharply.


RIGHT-ANGLE
ROLLER ENDS, precisely square to avoid end-creep, oscillation and side-shock.
RIGHT-ANGLE
BEARING SURFACES with parallelism that results in unwavering right-line rolling.
RIGHT-ANGLE
SEPARATOR SLOTS accurately machined to prevent roller skew, slide and uneven wear.

Rollways Roll Right Because They're Made Right

Let our engineers help you to select the Rollway bearing that is exactly right for your application. Our years of specialized bearing experience and complete engineering and metallurgical service are always at your command. No cost. No obligation.

Nationwide Replacement Service: Rollway bearings are available for replacement through authorized bearing distributors in principal cities. To locate, consult classified 'phone directories under BEARINGS. Rollway Bearing Co., Inc., Syracuse 4, N. Y.

SALES OFFICES

SYRACUSE	DETROIT
PHILADELPHIA	CLEVELAND
BOSTON	LOS ANGELES
PITTSBURGH	HOUSTON

ROLLWAY BEARINGS

Complete Line of Radial and Thrust Cylindrical Roller Bearings

and 100,000 hours and stress for creep rates 0.0001 and 0.00001 per cent per hour.

Booklet was prepared by Ward F. Simmons and Howard C. Cross of Battelle Memorial Institute, Columbus, O. Copies sell for $4 and are available from the ASTM, 1916 Race St., Philadelphia 3.

Data Given for Enamel

Assistance in metal finishing or coating problems is offered to industries as a service of the Porcelain Enamel Institute. A committee has been established for the purpose of researching new applications for enamel and to provide the consulting, technical or developmental assistance any metal product producer may need in testing enamel as his product finish.

Service will be furnished free of charge by the institute. Requests should be addressed to the institute's New Uses Committee, 1010 Vermont Ave. N. W., Washington 5.

Aluminum Seen as Conductor

Trend toward using aluminum instead of copper as an electric power conductor was reported recently by E. V. Sayles and C. E. Topping of Consumers Power Co., Jackson, Mich. They predict that because of the relative scarcity and high cost of copper, increased use will be made of aluminum as a conductor.

Aluminum, although its conductivity and strength are lower than that of copper, is very abundant. Lack of conductivity can be overcome by use of more metal and mechanical strength can be secured by stranding aluminum with metals of greater strength.

Furnace Installed

Stress-relieving furnace installed in the Eddystone, Pa., plant of Baldwin - Lime - Hamilton Corp., was built by the Industrial Power Equipment Co. The 22,760 cu ft recirculated - air, convection - type furnace will handle the weldments for presses, turbines and other products built by Baldwin.

Furnace is indirect fired through three combustion chambers controlled by temperature potentiometers and is also equipped with

the A-B-C of M-S-T

A LWAYS MAKES POSSIBLE
B ETTER PRODUCTS
C AT LOWER OST

Michigan
Electric Resistance
WELDED
STEEL
TUBING

A Quality Product

ROUND
⅜" to 4" O. D. 9 to 22 gauge
SQUARE-RECTANGULAR
½" to 2" 20 gauge, 1" to 2¾", 14, 16, 18 gauge
Carbon 1010 to 1025

Michigan Tubing has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

Horn Tube

Fabrication by Michigan of this volume part, which has a diameter variation of 51 per cent, is only one example of the workability of Michigan tubing and of Michigan engineering competence.

Tube dimensions are: 1.740" O. D. x .712" O. D. x .035" wall x 11.625" long. Into its manufacture go years of experience and skill in the fabrication of hundreds of widely different tubular parts, ready for assembly line operations by the customer.

We suggest you examine carefully the possible adaptability of Michigan welded steel tubing to your product, both for advantages of design and for more economical manufacture.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

Plus Fabricating of our own tubing Michigan is interested ONLY IN THE FABRICATION OF Stainless steel, copper, brass and aluminum tubing.

RESISTANCE WELDED STEEL TUBING
THE OLDEST NAME IN ELECTRIC
Michigan STEEL TUBE PRODUCTS CO.

More than 35 Years in the Business
9450 BUFFALO STREET • DETROIT 12, MICHIGAN
FACTORIES: DETROIT, MICHIGAN—SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Detroit, Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis —Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland Co., Dayton, Ohio—Dirks & Company, Portland, Oregon —James J. Shannon, Milton, Mass.—Service Steel Co., Los Angeles, Calif.—Hugh Davis, Jr., Sewickley, Pa.— Strong, Carlisle & Hammond Co., Cleveland, Ohio—Globe Supply Co., Denver, Colorado—W. A. McMichaels Co., Upper Darby, Pa.—A. J. Fitzgibbons Co., Buffalo, N. Y.—Harry E. Clark & Co., Houston, Texas—J. B. Beaird Co., Inc., Shreveport, La.

IN PEACE TIME . . . DEFENSE TIME . . . EVERY TIME . . .
Make "Standard" Your Source for Welded Tubing Efficiently Produced!
(24400 Plymouth Road at Telegraph)
Specially Designed Now Modern Plant with Complete Facilities for Production of:
★ Welded Mechanical
Boiler and Heat Exchanger
Welded Stainless
★ Exclusive "Rigidized" Patterns
ROUND • SQUARE • RECTANGULAR • SPECIAL SHAPES
Including UPSET • FLARED • FLANGED • TAPERED
THE STANDARD TUBE CO.
Detroit 28, Michigan
Welded Tubing
Fabricated Parts
Complete Range of Electric Weld Tubing for Structural, Mechanical and Pressure Applications
Here in this great new plant are the most modern and complete facilities for the manufacture of Welded Steel and Stainless Steel tubing found anywhere. Let "Standard's" specialists help you!
Steel Tubing Sizes: ½" O.D. to 5½" O.D. .028 to .360 wall
Stainless Sizes: ¾" O.D. to 3" O.D. .028 to .095 wall

complete program control. Rate of heating, length of soaking time and rate of cooling are all set at the control board when the heat is begun.

Belting Requirements Cataloged

Grades and types of belting best adapted to each drive are listed in a 40-page belting catalog and manual published by Graton & Knight Co., Worcester, Mass. Also shown are maintenance tips that provide detail on making belts last longer through proper care and techniques for making leather belts endless. Engineers should find useful reference charts and tables that list horsepower ratings, belt speeds, specifications of controlled tension bases. Proper use of these with other data included should permit accurate calculation of belting requirements for any job. Company's field offices will act as distributors for the manual.

Maintenance Ideas Suggested

Plant maintenance digest suggests materials and methods for performing 54 maintenance cleaning and related tasks. It stresses importance of selecting correct material for each operation and recommends specific materials and methods for each job.

Purpose of the book is to help operators in obtaining maximum benefits from plant maintenance programs. Requests should be addressed to Oakite Products Inc., 134 E. Rector St., New York 6.

Reference Shows Welder Care

Three basic sections dealing with general material, maintenance and accessories cover care of stud welding equipment in a handbook published by KSM Products Inc. The 12-page manual provides a quick, easy reference for maintenance men by supplementing data with drawings, charts and photographs to illustrate specific components and problems. Copies are available from the company's Stud Welding Division, Merchantville, N. J.

Sheet Metal Facilities Open

Booklet describes and illustrates facilities, management and finances of Lyon Metal Products Inc., Aurora, Ill. Called "Craftsmen in

WHY FARREL SPEED REDUCERS *STAND OUT* on jobs like these...

Two single reduction units driving a skip hoist

Single reduction unit driving a rolling mill

Double reduction unit driving rotary kiln in cement mill

The design of Farrel speed reducers permits an engineering freedom in proportioning gears, shafts, bearings and even some housing dimensions to meet specific load, speed and service requirements. This flexibility has resulted in the solution of innumerable application problems.

In addition, Farrel speed reducers have a number of other advantages which account for their outstanding performance record in handling tough assignments. The quiet, vibration-free operation of the herringbone gears results from extreme accuracy of tooth spacing, contour and helix angle... qualities inherent in the Farrel-Sykes method of gear generation. Precision manufacture and highest grade materials contribute to long gear life.

Shafts and bearings are factored to safeguard against interruption of vital processes. Gear cases are proportioned to withstand repeated heavy peak loads. Joints are sealed to prevent entrance of dirt.

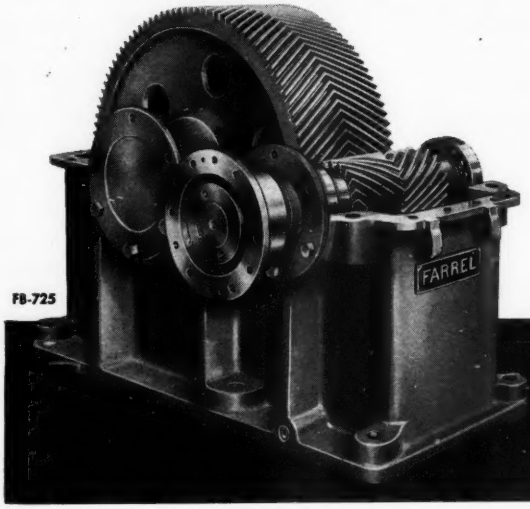
Write for further details of these outstanding units. Ask for a copy of Bulletin 449.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Detroit, Chicago, Portland (Oregon), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

Farrel-Birmingham®



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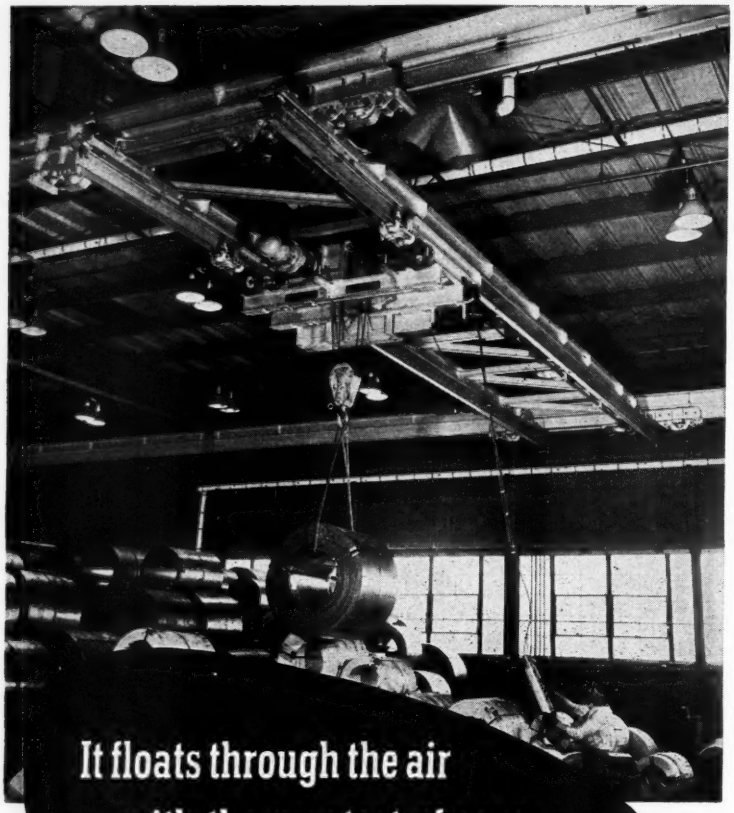

when handled by

AMERICAN MONORAIL CRANES

One man easily unloads, stores and moves seven-ton coils of steel with this 10-ton American MonoRail Crane. These cranes furnish efficient operation where low headroom is a critical problem. Interlocking devices permit carrier to travel beyond craneways. Loads are moved over maximum area. Articulated trolleys assure perfect alignment of trucks for smooth crane travel. American MonoRail Cranes are ruggedly built to handle loads up to 10 tons at operating speeds of 500 feet per minute.

Let an American MonoRail engineer tell you about these fast-moving constant-service cranes.

Please write us.

THE AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE • CLEVELAND 7, OHIO

Sheet Metal Production" it describes operations carried on at two Lyon plants in Aurora and York, Pa., covering 581,000 sq ft of manufacturing floor space.

Complete list of all equipment and machinery is given. Inquiries should be addressed to the company at Aurora.

Hot Paint Spraying Made Safer

Application of a new heater may make hot paint spraying more common in the field of automotive refinishing. The paint heater, devised through use of General Electric Calrod tubular units, is being made by Bede Products Inc., Cleveland.

James A. Bede, president, says experiments show the development enables automotive refinishers to reduce paint costs by 25 per cent and manhours per job by nearly 40 per cent. Quality of finish is said to be improved. In addition, the official points out that adoption of the Calrod units permits the firm to make paint heaters completely explosion-proof.

Basic design that proved a satisfactory, safe way to heat paints and varnishes for Bede is a 650-w tubular heater cast into an aluminum plate. In this application, a 24-inch straight heater length is bent into a circular shape, then cast into the aluminum base that fits into the bottom of the paint receptacle.

Hobs Are Unground

Unground hobs are made to close tolerances by the Michigan Tool Co., Detroit. The company claims that the process makes it possible to use unground hobs in applications where only ground form hobs were formerly considered suitable.

Electrical Safety Summarized

Promotion of plant safety is the purpose of a booklet published by General Motors Corp., titled "Safety Interpretations of J.I.C. Electrical Standards for Machine Tools and Other Industrial Equipment." Manual contains only those standards that cover safety requirements, showing the specification and following with explanation of dangers involved. In 23 instances

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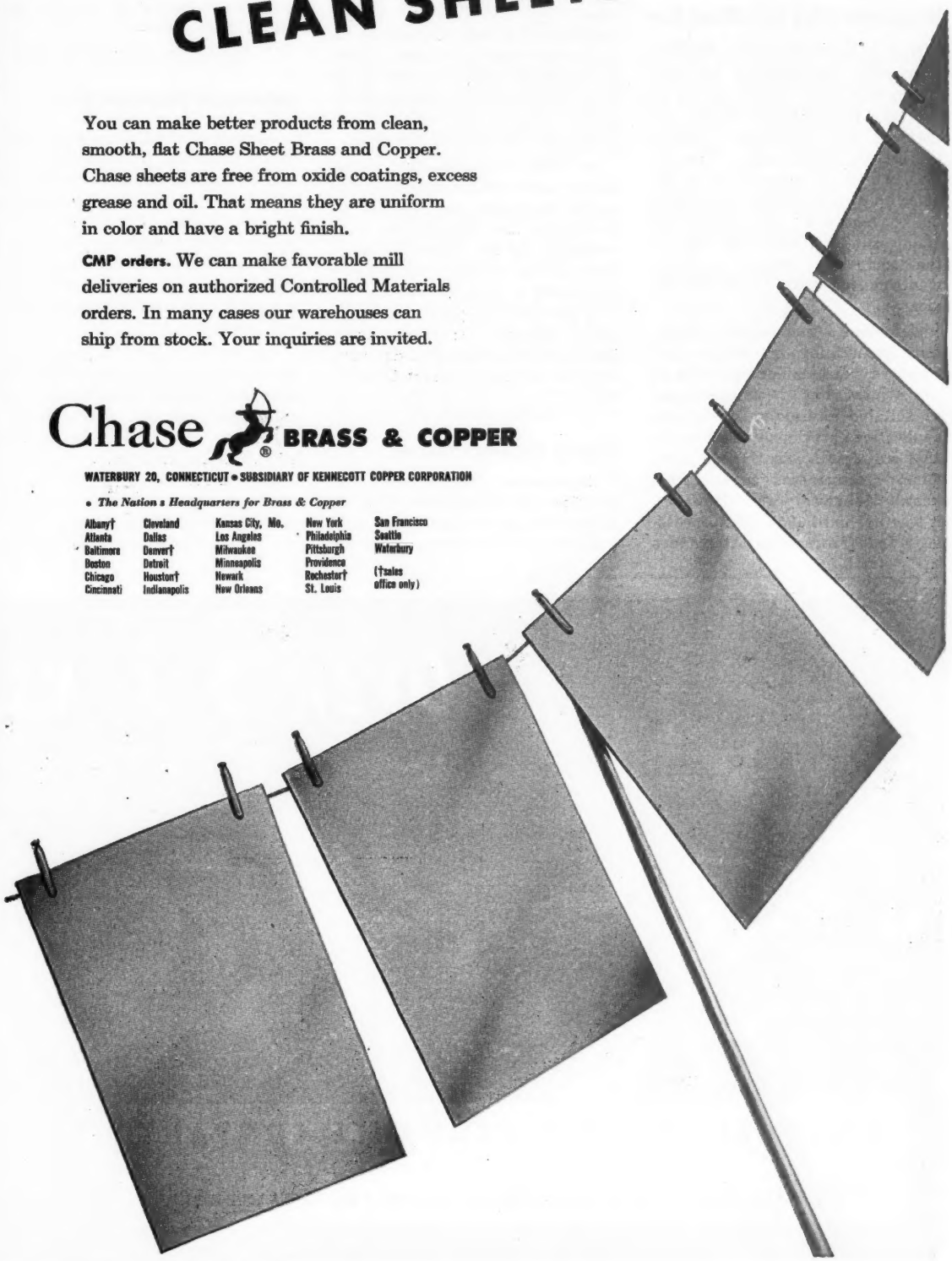

photographs are included showing good and bad examples of electrical design and practice as applied to machine tools.

Manganese Alloy Cuts Nickel Use

New group of stainless steels is introduced commercially to help circumvent the critical nickel shortage, says the 1951 annual report of the Allegheny Ludlum Steel Corp., Pittsburgh. The alloys, which use manganese to replace all or most of the nickel used in conventional chromium-nickel stainless steels, represent one of the company's product achievements during 1951, the report indicates.

Chromium - manganese alloys, some containing no nickel and some with only minor additions of the element, have been introduced as suitable alternates for specific applications previously filled by the 18-8 stainless steels. These chromium - manganese steels were known for many years. However, it was not until 1951 that processing and fabricating techniques were developed that permit their production in substantial quantities.

Other new steels introduced by the company in 1951 include high temperature alloys for military jet engines and a high manganese alloy for automotive exhaust valves. In almost all instances, new alloys were developed to overcome shortages of alloying materials that cut production throughout the year.

In total business, the report shows complications caused by materials shortages and controls on production and distribution were untangled to the extent of about $229 million in sales. This figure represents a gain of $51 million over any previous year in the company's history. Increased taxes and production costs held net earnings for the year to about $8.8 million.

Process Purifies Titanium

Magnesium and magnesium chloride can be removed from titanium by vacuum distillation says a report from the Bureau of Mines. Booklet describes the process, equipment, loading, heating and unloading. It also points out the limitations of the method. Copies of report of investigations 4837 may be obtained from the bureau, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13.

Galvanizers Meet Apr. 21-22

Meeting of the Galvanizers Committee, held for technical and operating men of the steel industry's galvanizing division, is scheduled for Apr. 21-22 at Hotel Statler, St. Louis. The committee is sponsored by American Zinc Institute and meets concurrently with the annual conference held by the parent group.

On Monday, Apr. 21, committee members will attend the Zinc Institute's opening session; in the afternoon they plan a trip to the Fairmont Zinc Smelter of American Zinc Co. of Illinois at E. St. Louis. Featured speakers at the open meeting Tuesday morning are A. R. Ryan, General Electric Co.; G. F. Weaton, St. Joseph Lead

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Co.; and G. N. Olson, Spencer Chemical Co. Section on hot dipped galvanized pipe, headed by J. T. Bolger, Jones & Laughlin Steel Co., will meet separately Tuesday morning.

Sulphur Corrosion Charted

"Corrosion by Sulphur and Sulphur Compounds at Elevated Temperatures" is the subject of a paper presented to the Chemical Industry Symposium, National Association of Corrosion Engineers, March 12, at Galveston, Tex. Based on laboratory and field test data, the different factors that influence corrosive attack on heat resisting alloys when exposed to hot sulphur-containing atmospheres were evaluated.

The authors pointed out importance of alloy composition because of its effect on fusion temperatures of sulphide corrosion products and upon the mode of formation of these compounds at and beneath the metal surface. They noted that extent of attack is less severe under conditions that permit simultaneous formation of an oxide film. Their conclusion holds that sulphidation of pure nickel and high nickel alloys induces embrittlement as a consequence of low-melting reaction products disposed principally in grain boundaries.

Authors are E. N. Skinner, technical service section, Development & Research Division, International Nickel Co. Inc. and W. Z. Friend, corrosion engineering section, International Nickel.

Free Government Patents Listed

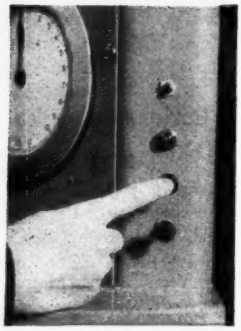
List of 2339 patents owned by the government and available to U. S. businessmen for use without charge is published by the government patents board. Book presents its information first chronologically by Patent Office numbers, giving descriptive titles, inventors' names, agencies administering the patents and industrial classification under which each invention falls. Second section gives a cross-reference listing of the items under 21 major standard industrial classifications. Book sells for $1 at Dept. of Commerce field offices or the government printing office, Washington.

Firm Licenses Reclaiming Work

New Process D-Enameling Corp., Aurora, Ill., announces it will license foreign firms to use its patented reclamation process. Earl P. Calkins, vice president, says one company in each country will get exclusive control. New Process started work at its 30,000 sq ft plant in Aurora last year after two years' pilot plant operations in Chicago proved successful.

Nylon Used for Cams

Nylon is finding an increasing use for cams and noncontinuous bearings in light machinery since it will operate satisfactorily over long periods without any lubrication. It has, however, several characteristics which make it difficult to machine: The material is flexible and must not be distorted in clamping or through tool pressure, material is abrasive and creates a tool wear problem, it has a



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How long does sample analysis take, by standard chemical means? An average value would be from 15 to 20 minutes per analysis, using established wet-chemical laboratory methods.

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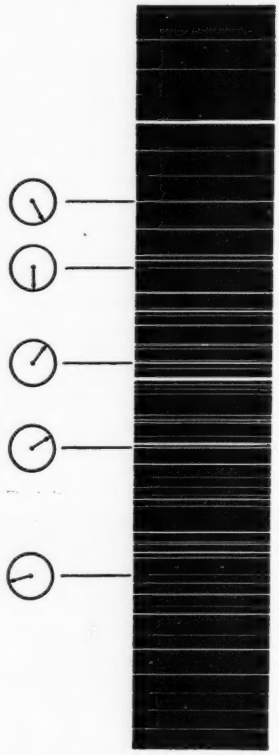

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IS NEEDLESS WASTE

The Baird Associates-Dow Direct Reading Spectrometer permits a total analysis cycle — from furnace to laboratory to furnace correction — in about 5 minutes.

The "Direct Reader" is DIRECT — large clock-type dials indicate the percent concentration of each alloying element, in about 40 seconds after the single button control is pushed.

A complex analysis for 15 alloying elements takes no longer than a simpler analysis for 5 elements.

A conference with a Baird Associates engineer will be arranged at your request and convenience. Our new Bulletin #34, on Direct Reading Analysis, is furnished free to those who request it.

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low melting point and must not be overheated during cutting.

Process Gear Co., Syracuse, N. Y., machines several nylon parts for sewing machines. A progressive broach designed by Colonial Broach Co., Detroit, works at 18 fpm. Soapy water is the coolant not only for broaching, but also for turning inside diameters with high speed steel tools.

Program Controls Lubrication

Systematic lubrication scheduling is part of the preventive maintenance plan at Timken Roller Bearing Co., Canton, O. Plasticized lubrication cards are attached to each machine. Each card indicates the lubricants to be used in all parts of the machine. Frequency of lubrication, types of lubricants and methods of procedure appear in a separate lubrication manual used by the maintenance department.

Since Timken buys its lubricants in large quantities, they find it economical to blend their own to gain special qualities for a particular job. For other conditions special purpose oils are purchased. Object of program is to decrease maintenance costs and lost time.

Welding Text Offered

Comprehensive and practical textbook on the procedure and practice of arc welding, "Modern Arc Welding", is published by the Hobart Trade School, Troy, O.

Chapters discuss the development of arc welding, applications and procedures. A complete self study course is included as are descriptions of other welding processes. Book is illustrated and costs $3.00 per copy. Address the Hobart Trade School, Hobart Square, Troy, O.

Bellows Convolutions Redrawn

Short-cut to the tedious job of reproducing metal bellows convolutions in sketches and drawings is offered by Clifford Mfg. Co., Waltham, Mass. The answer is a kit holding templates that cover 20 of the most popular bellows sizes. In use, selected template is placed under the tracing paper, center line matching that of the sketch or production drawing. Body and type

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of bellows ends can then be traced quickly and dimensions added as shown on the template. Kits will be supplied free to requests on company letterhead.

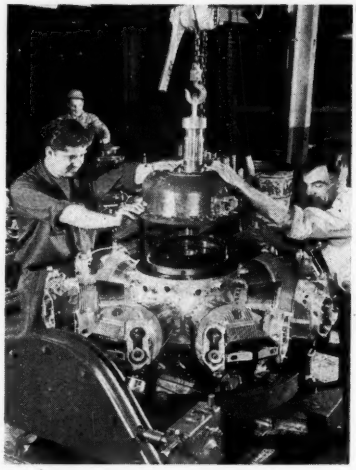
Tooling Capacity Listed

Facilities of the A. W. Hecker Co., Cleveland, for creative engineering, tooling and parts production are outlined in booklet form. Company highlights its experience in the manufacture of tools, jigs, fixtures and special machining, and emphasizes its ability to complete an entire tooling program.

Lists of the company's tool room and production equipment are included. Requests for booklet should be addressed to the company, 7110 Euclid Ave., Cleveland 3.

Cleaner Works 30-Second Cycle

Cleaning time is held to about 30 seconds for removing sand and scale from a cast railroad wheel at American Brake Shoe Corp.'s Southern Wheel Division, Birmingham. Special airless blasting cabinet does the job on a production basis. Cleaning is done by steel shot abrasive, hurled with centrifugal force. Spinner rolls inside



Fruits of Conversion

First military aircraft engines delivered by Kaiser-Frazer in its conversion program are shown in final assembly at the automaker's Detroit Engine Division. Engines are the Wright Cyclone R-1300. K-F is using about 740,000 sq ft here and at Dowagiac, Mich., to work on the aircraft engine project

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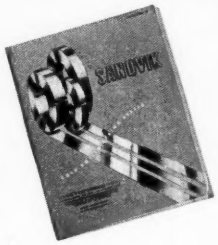

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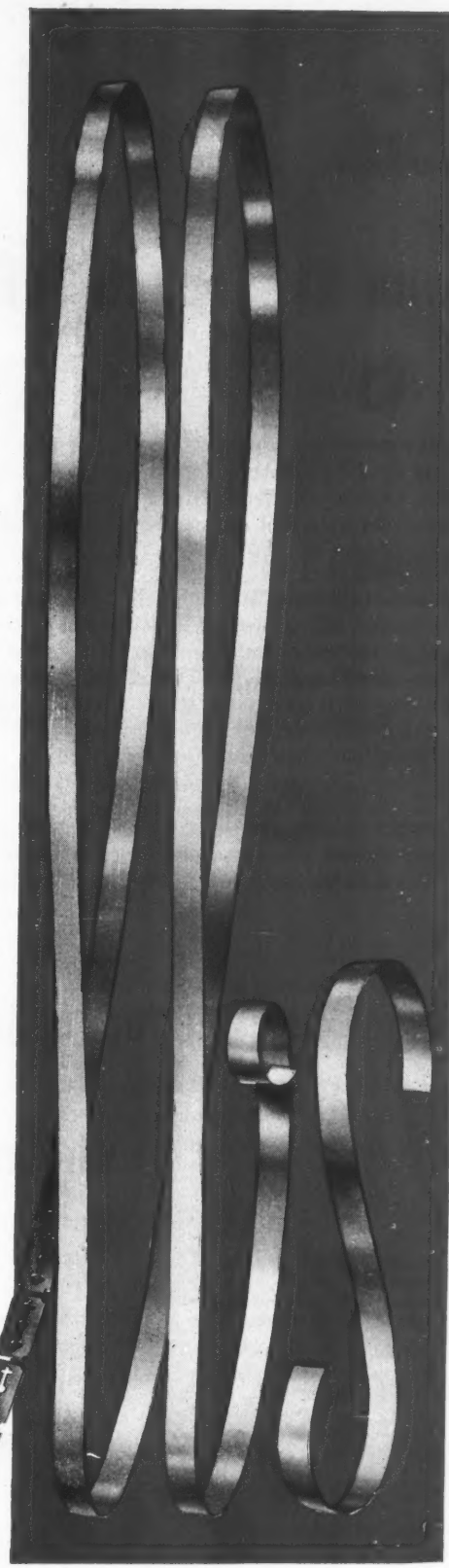

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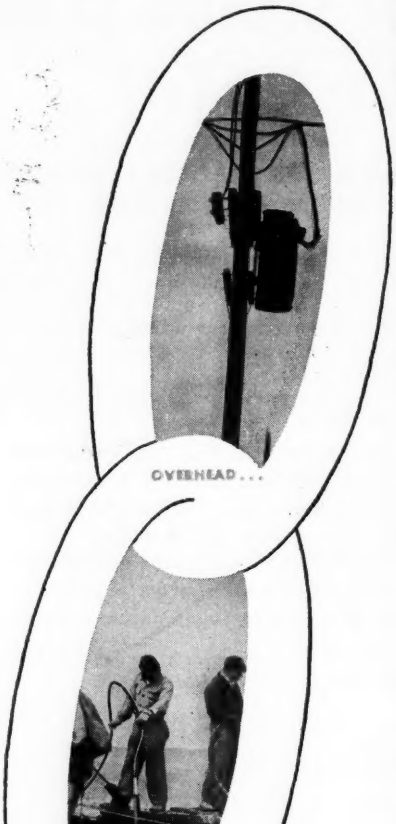

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the cabinet rotate each wheel under the blast stream so abrasive reaches all areas. Cleaning rate of 120 wheels per hour is maintained.

Plant cleaning room accommodates two days' production, providing one day for parts to cool before processing. Cabinet loading mechanism takes each wheel on a curved, grooved arm that fits the wheel's flanged section. When the loader is actuated, wheel rises, rolls into the cabinet and onto the spinner rolls. Simultaneously, an elevator inside expels a cleaned wheel that moves on to a grinding operation for removing burrs and ragged edges.

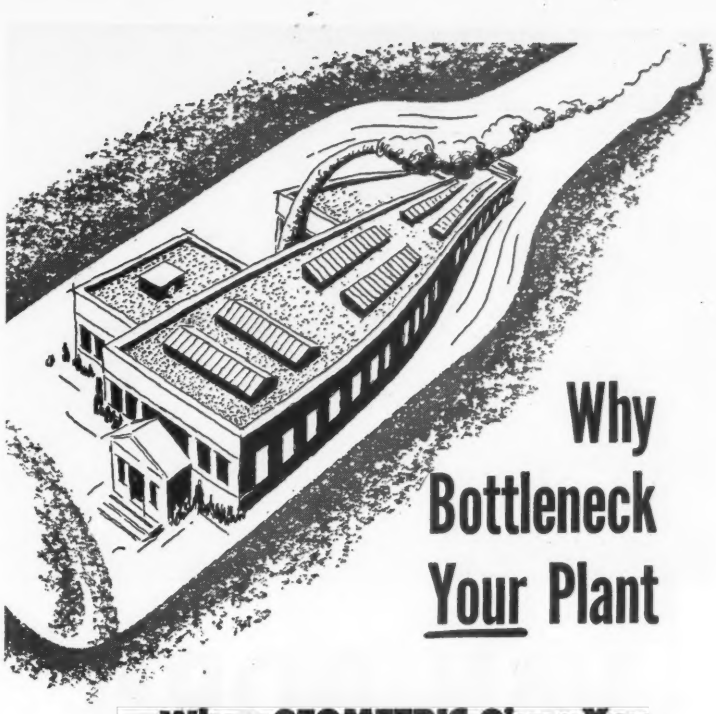
The company reports its sand and scale removal was done formerly by air blasting with sand at a rate of 90 wheels per hour. This lagged 30 pieces behind the present rate and current pace is confined by time taken in subsequent line operations. Another advantage is the reported reduction by one man found possible in the cleaning room crew. Cleaning machine was designed by American Wheelabrator & Equipment Co., Mishawaka, Ind.

Alloy Meets Maintenance Needs

Alloy steel designed to satisfy needs of machinery maintenance parts is announced by Carpenter Steel Co., Reading, Pa. Called No. 5-876, the steel meets three different service requirements. It can be used for hard-tempered parts requiring high surface hardness and wear resistance, with good strength and toughness to withstand heavy shocks and loads. When drawn between 400 and 500°F, the steel has properties needed (Rockwell C-50-56) for applications in gears, racks, clutch and locking pins and similar machine parts.

Another use is found in rough tempered parts that do not require high surface hardness, but must have greatest possible strength or toughness. Drawn between 700 and 1200°F, the steel has properties to do the job for parts such as shafts, axles, bolts and studs. Tests show 115,000 to 235,000 psi tensile; C-31-49 Rockwell; and 286-477 Brinell.

It is also applicable as a mild



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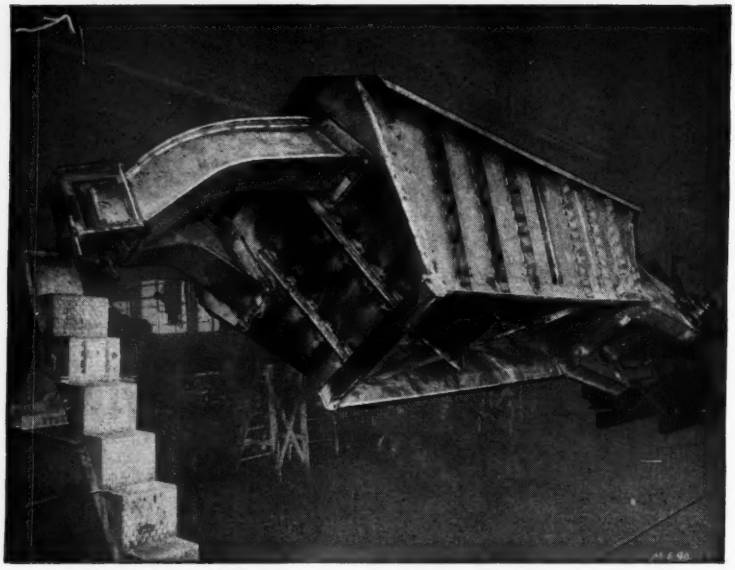

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tempered alloy steel that can be machined readily in the treated condition as received. Average properties in this condition are 135,000 psi tensile and 275 Brinell.

Type analysis of No. 5-876 is as follows: Carbon, 0.50 per cent; manganese, 0.85; silicon, 0.25; chromium, 0.70; nickel, 0.55; molybdenum, 0.10; vanadium, 0.10; and boron, added.

Shell Molding Will Be Shown

Demonstrations of the shell molding process with an automatic shell molding machine will be featured at Monsanto Chemical Co.'s exhibit in the International Foundry Show in Atlantic City, May 1-7.

Machine will turn out 45 shells an hour using phenolic resin and sand. In addition, a number of shell molds and castings made from them will be on display at the booth.

Dry Air Cuts Rust

Relative humidity is held to 40 per cent in a steel coil storeroom by a dehumidifier. Unit is made by the Pittsburgh Lectrodryer Corp., Pittsburgh. Steel shows no signs of rust after 11 months in storage. Savings in tangible factors such as labor, oil and inspections are estimated at $2000 a year.

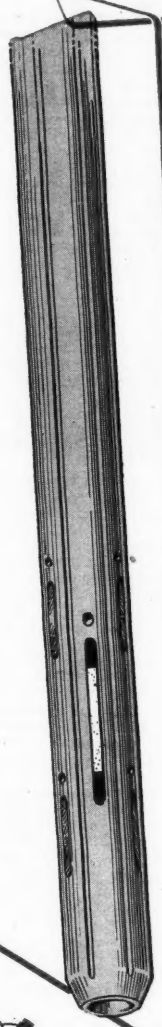
Flow Meters Discussed

Handbook is published by the Fischer & Porter Co. to aid in the selection and sizing of variable-area meters. Complete description of the meters, tubes and floats and their comparison with variable-head meters, as well as calibration prediction data has been included. Handbook may be secured by writing to the Fischer & Porter Co., Hatboro, Pa.

Fan Specifications Given

Propeller fans for ventilation and comfort cooling in industrial, commercial and residential applications are discussed in a catalog from Chelsea Fan & Blower Co. Inc., Plainfield, N. J. Booklet includes specifications, dimensions, installation diagrams and product photographs with prices. Address requests for copies to the company.

PRECISION
in Hydraguide steering control generated by Microhoning



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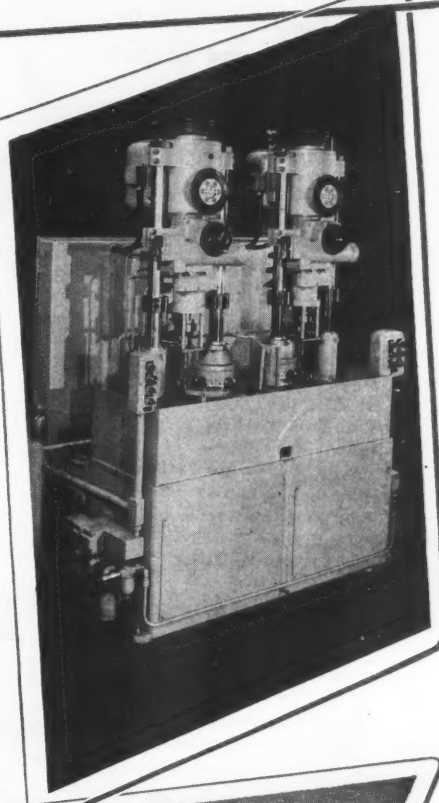

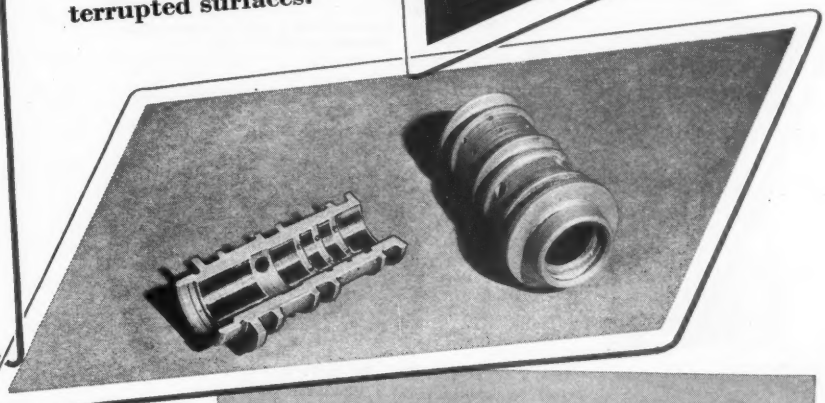

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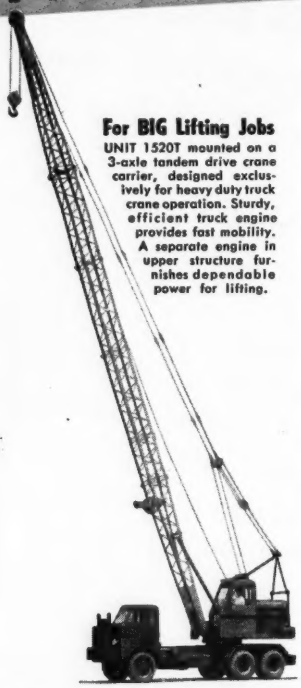

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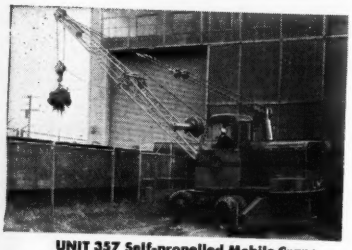

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CALENDAR
OF MEETINGS

April 9, Cutting Tool Manufacturers Association: Spring meeting, Hotel Cleveland, Cleveland. Association address: 416 Penobscot Bldg., Detroit. Secretary: Emil Gairing.

April 9-11, Society of the Plastics Industry Inc.: Annual technical session, Reinforced Plastics Division, Edgewater Beach Hotel, Chicago. Society address: 67 W. 44th St., New York 18. Secretary: William T. Cruse.

April 16-18, American Institute of Electrical Engineers & American Welding Society, Detroit Section: Annual welding conference, Rackham Memorial Bldg., Detroit. Conference publicity: J. S. Francis, Consumers Power Co., Jackson, Mich.

April 17-18, Caster & Floor Truck Manufacturers Association: Spring meeting, Hotel Hollenden, Cleveland. Association address: 7 W. Madison St., Chicago 2. Secretary: Harry P. Dolan.

April 17-18, American Machine Tool Distributors Association: Annual spring meeting, Edgewater Beach Hotel, Chicago. Association address: 1900 Arch St., Philadelphia. Executive secretary: Thomas A. Fernley Jr.

April 18-19, Lead Industries Association: Annual meeting, Hotel Drake, Chicago. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 18-19, National Association of Cost Accountants: Regional cost conference, Atlanta. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnarson.

April 18-21, Grinding Wheel Institute: Spring meeting, The Homestead, Hot Springs, Va. Institute address: 2130 Keith Bldg., Cleveland 15. Secretary: Frank G. Gustafson.

April 20-24, National Industrial Service Association: Annual convention, Hotel Conrad Hilton, Chicago. Association address: 818 Olive St., St. Louis 1. Convention publicity: McGiveran-Child Co., 162 N. Clinton St., Chicago 6.

April 21-22, American Coke & Coal Chemicals Institute: Eastern regional meeting, Westchester Country Club, Rye, N. Y. Institute address: 711 14th St., NW, Washington. Executive secretary: Samuel Weiss.

April 21-22, American Zinc Institute, Inc.: Annual meeting, Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary: Ernest V. Gent.

April 21-24, Society of Automotive Engineers: National aeronautic and aircraft engineering display, Hotel Statler, New York. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

April 23-25, American Institute of Steel Construction Inc.: Spring engineering conference, Hotel Commodore, New York. Institute address: 101 Park Ave., New York 17. Executive vice president: L. Abbett Post.

April 27-May 1, American Ceramic Society: Annual meeting, William Penn Hotel, Pittsburgh. Society address: 2525 N. High St., Columbus, O. Secretary: Charles S. Pearce.

April 28-29, Association of Iron & Steel Engineers: Spring conference, Netherland Plaza Hotel, Cincinnati. Association address: 1010 Empire Bldg., Pittsburgh 22. Managing director: T. V. Ess.

April 28-30, Chamber of Commerce of the U. S.: Annual meeting, Chamber of Commerce Bldg., 1615 H St. NW, Washington 6. Executive vice president: Arch N. Booth.

April 28-May 3, Concrete Reinforcing Steel Institute: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 38 S. Dearborn St., Chicago 3, Managing director: H. C. Delzell.

April 29-30, Metal Powder Association: Annual spring meeting, Hotel Drake, Chicago. Association address: 420 Lexington Ave., New York 17. Acting secretary: Robert L. Ziegfeld.

April 30-May 4, Industrial Diamond Association of America Inc.: Annual meeting, Princess Hotel, Bermuda. Association address: 124 E. 40th St., New York. Secretary: Athos D. Leveridge.

(Continued on p. 184)

where small size pays off...

If you have a product where small size is both a big advantage and a big problem—consider the use of Torrington Needle Bearings.

A full complement of small diameter rollers permits the distribution of loads over a large area. Needle Bearings have a smaller O.D. in relation to capacity than any other type of anti-friction bearing. Both civilian and military products can benefit from this and other Torrington Needle Bearing features. Ask our engineers to give you a helping hand.

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Torrington, Conn. South Bend 21, Ind.
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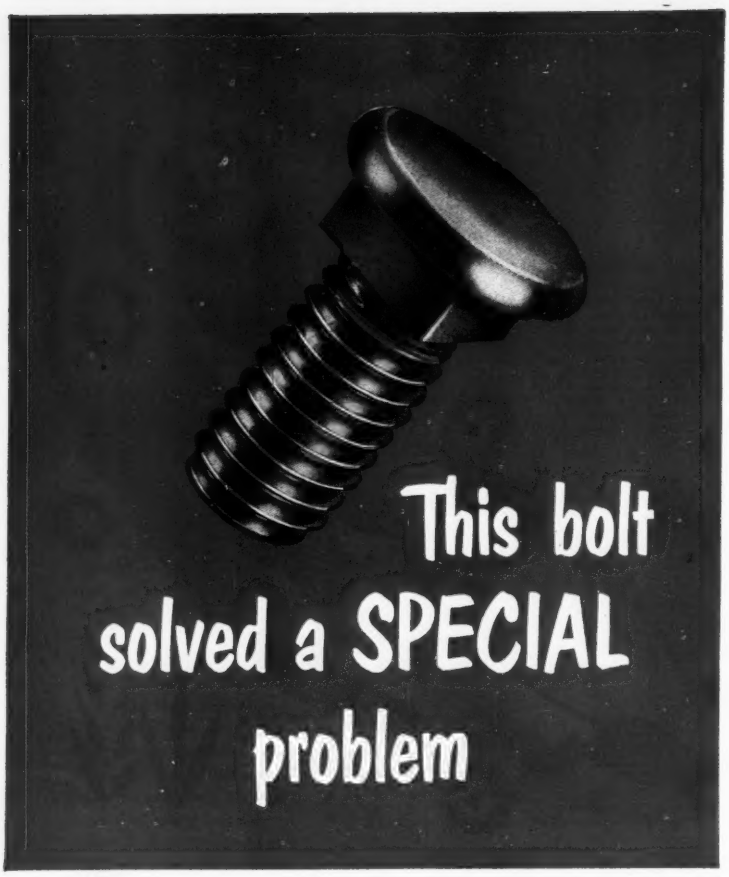
TORRINGTON NEEDLE BEARINGS

Needle • Spherical Roller • Tapered Roller • Straight Roller • Ball • Needle Rollers



This Brake Pedal Bolt was designed and made to do a special job better, faster and more economically. It is typical of what you can expect when you use our experience to solve your fastener problems. We'd like to discuss all of the advantages we can offer you . . . in detail. Why not call us in.

● To help simplify specifying and ordering fasteners, you need the latest catalog information. You can get it with our No. 51 catalog. Write for your copy today.

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BOLT COMPANY
Division of Buffalo-Eclipse Corporation
North Tonawanda, N. Y.
Sales Offices in Principal Cities
PRODUCERS OF CIRCLE PRODUCTS — BOLTS • NUTS • RIVETS AND SPECIAL FASTENERS

(*Continued from p. 182*)

May 1-7, American Foundrymen's Society: Annual meeting, Convention Hall, Atlantic City, N. J. Society address: 616 S. Michigan Ave., Chicago. Secretary: W. W. Maloney.

May 1-7, Annual International Foundry Congress & Exposition: Convention Hall, Atlantic City, N. J. Host: American Foundrymen's Society.

May 2-3, Industrial Fasteners Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 3648 Euclid Ave., Cleveland. Secretary: James D. Eggers.

May 4-8, Electrochemical Society Inc.: Semiannual meeting, Benjamin Franklin Hotel, Philadelphia. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

May 5-7, Automotive Engine Rebuilders Association: Spring meeting, Hotel Plaza, San Antonio, Tex. Association address: 419 N. Capitol Ave., Indianapolis, Ind. Executive vice president: R. G. Patterson.

May 5-7, American Mining Congress: Annual spring meeting, Netherland Plaza Hotel, Cincinnati. Congress address: 1102 Ring Bldg., Washington 6. Secretary: Julian D. Conover.

May 6-8, National Highway Users' Conference: Highway transportation congress, Washington. Conference address: National Press Bldg., Washington 4. Director: Arthur C. Butler.

May 6-9, Scientific Apparatus Makers Association of America: Annual meeting, Edgewater Beach Hotel, Chicago. Association address: 20 N. Wacker Drive, Chicago 6. Secretary: Kenneth Anderson.

May 7-9, Industrial Waste Conference: Purdue Memorial Union, Purdue University, E. Lafayette, Ind. Secretary: Prof. Don E. Bloodgood, Sanitary Engineering Dept.

May 7-10, National Screw Machine Products Association: Annual spring meeting, Hotel Chase, St. Louis. Association address: 2860 E. 130th St., Cleveland. Executive secretary: Orrin B. Werntz.

May 8-9, The Wire Association: Spring meeting, William Penn Hotel, Pittsburgh. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

May 8-9, National Association of Sheet Metal Distributors: Spring meeting, William Penn Hotel, Pittsburgh. Association address: 1900 Arch St., Philadelphia 3. Executive secretary: Thomas A. Fernley Jr.

May 8-9, American Institute of Mining & Metallurgical Engineers: Northwest metals and minerals conference, Davenport Hotel, Spokane, Washington. Publicity director: W. S. Patterson, Kaiser Aluminum & Chemical Corp., Spokane 10.

May 11-14, American Institute of Chemical Engineers: Annual spring meeting, French Lick Springs Hotel, French Lick, Ind. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

May 11-14, Industrial Furnace Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York 17. Secretary: V. P. Gopcevic.

May 12-14, Liquefied Petroleum Gas Association Inc.: Annual meeting and exhibit, Palmer House, Chicago. Association address: 11 S. LaSalle St., Chicago 3. Secretary: Arthur C. Kreutzer.

May 14-15, National Industrial Conference Board: Spring conference, Waldorf-Astoria Hotel, New York. Address: 247 Park Ave., New York 17. Assistant director, conference division: (Mrs.) I. E. Brown.

May 14-16, American Leather Belting Association: Spring meeting, Skytop Lodge, Skytop, Pa. Association address: 320 Broadway, New York 7. Secretary: E. R. Rath.

May 14-16, Society for Experimental Stress Analysis: Spring meeting, Hotel Lincoln, Indianapolis. Society address: Box 168, Cambridge, Mass.

May 19-21, American Supply & Machinery Manufacturers Association: Annual convention and conference booth activity, Hotel Traymore, Atlantic City, N. J. Association address: 731-732 DuPont Circle Bldg., Washington. General manager: R. Kennedy Hanson.

Salesman Turns Sleuth... Solves Welding Riddle

TROUBLE struck a large Midwestern company producing supply tanks for Naval Ordnance hydraulic systems. Pin holes were appearing in welds joining fittings to the tanks.

The M&T sales engineer, called in to assist, ran many tests—discovered that fittings and tanks were of stainless steel of different chemical content. Tanks were made from 10 gauge columbium -modified 18-8, but fittings had been machined from selenium-bearing stainless to secure better machining properties.

RECOMMENDED: Use of Murex lime-coated stainless electrodes in place of titanium-coated electrodes to prevent formation of gas in welds involving the selenium steel.

RESULT: Porosity arrested—production resumed—Case Closed!

Your nearby M&T representative is qualified to give genuine assistance on any welding problem. Call on him when you need help. Make use of his broad background of experience in every phase of welding.

MUREX®

Electrodes

Arc Welders • Accessories

METAL & THERMIT CORPORATION 100 East 42nd Street, New York 17, N. Y.

Iron and Steel *need protection too!*

If it's made of iron or steel,
and exposed to the elements,
remember to have it
Hot-Dip Galvanized—*sealed in zinc!*

HANLON-GREGORY
Galvanizing Company

Pittsburgh . . . Pennsylvania

The World's Largest Job Galvanizing Plant

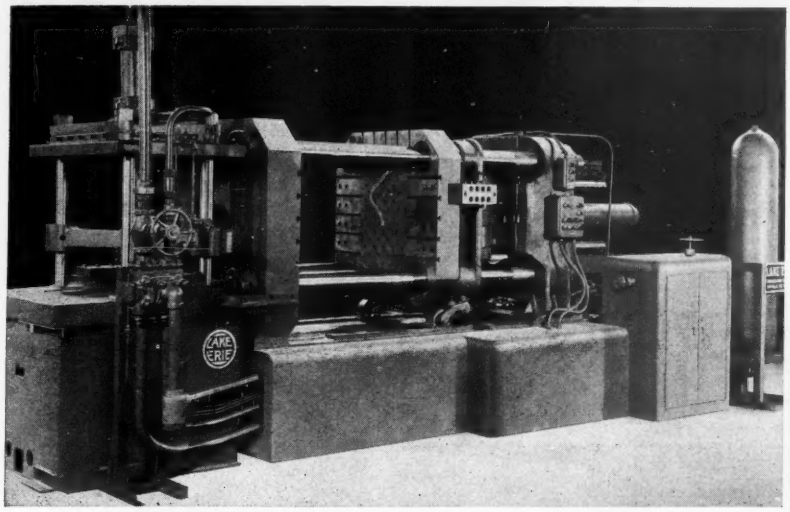
A. J. DIEBOLD, President

in the heart of the STEEL INDUSTRY

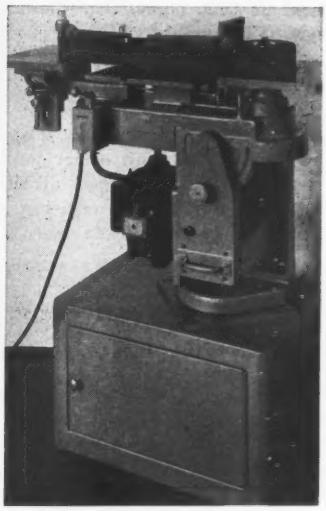
HOT DIP

galvanizing . . . . pickling . . . . painting . . . . oiling

New Products and Equipment



TWO PRODUCTION FEATURES DEVELOPED FOR DIE CASTING LINE
. . . incorporating toggle and injection unit ups output a reported 15-25 per cent



GRINDER FOR SMALL PARTS
. . . meets problem of off-hand operation

Die Casting Line Improved

USE REPLY CARD—CIRCLE No. 1

Lake Erie Engineering Corp., 700 Woodward Ave., Buffalo 17, N. Y., announces an improved line of die casting machines. Incorporating two features developed by the company, the wedge cam toggle and Pressure-Pac injection unit, these models are said to account for a production increase of 15 to 25 per cent. Wedge cam toggle is a self-compensating toggle clamp that automatically takes up clearances in dies due to contraction and expansion of molds during production or shutdown periods. It engages and disengages easily without binding through use of a circular cam contact surface with rolls that guide toggles.

Pressure-Pac injection unit is designed to provide denser castings. Job is done by compressing porosity at the time metal solidifies. Standard unit is arranged for 2 to 1 pressure increase, but special units for higher ratios are available. The line of casting machines is available in 10 models, from 100 to 1000-ton capacity.

Two-Scale Hand Pyrometer

USE REPLY CARD—CIRCLE No. 2

Hand pyrometer with two scale ranges for rapid and convenient measurement of surface, liquid, gas and molten metal temperatures is announced by Meter and Instruments Dept., General Electric Co., Schenectady 5, N. Y. Designated type FH-1, the pyrometer is useful where a permanent temperature detector is unnecessary. Its two scale ranges are 0-500° F and 0-1500° F. Change from one scale to the other is done through a simple switch.

Three interchangeable tips available include a surface tip, two-prong contact tip and immersion tip for liquids and molten metals. These, with flexible and rigid extension arms, can be changed easily. Automatic cold-junction compensation eliminates need for manual adjustment of the pointer for variations in temperature of instrument or surrounding atmosphere. Readings can be made directly from either scale without calculations or corrections.

REPLY CARDS

on page 201 will bring you more information on any new products and equipment in this section.

Machine Grinds and Finishes

USE REPLY CARD—CIRCLE No. 3

George F. Grant Co. Inc., W. Newton 65, Mass., introduces a versatile grinding, finishing and polishing unit. Available in two models, the UM-60 (see cut) is 2½ x 60 inches; UM-45 is 4 x 60 inches. Unit is designed to meet problems presented by production of small parts that must be ground and finished off-hand. Machine uses contact wheel method of coated abrasive belt polishing. It also features platen-supported belt grinding, concave and convex contour grinding and polishing and ¼ to ½-inch radius grinding and polishing. Addition of internal grinding attachments makes it capable of working areas from ⅝-inch to 2 inches I.D.

Mounted on a fabricated steel cabinet base, the grinder can be rotated 360 degrees with automatic locking at every 90 degrees.

Pneumatic Spring Tester

USE REPLY CARD—CIRCLE No. 4

Nondeflecting weighing table that permits use of a fixed stop in the ram assembly is a feature of a pneumatic spring tester made by Link Engineering Co., 13843 Elmira Ave., Detroit 27, Mich. Result is a fixed anvil that makes possible a testing cycle of only two

seconds or less, because the anvil does not move. Adjustable stop is set for a given height or thickness of part to be tested and remains fixed at that point, regardless of load. The amount of air pressure required to keep the anvil from moving registers on the gage.

Thus, all variables but that of the load are eliminated. Gages are supplied to read either go or no-go values or to read directly in pounds. Reading on either gage is the air pressure converted to pounds necessary to offset pressure on anvil by object being tested.

Fluid-Powered Speed Reducer

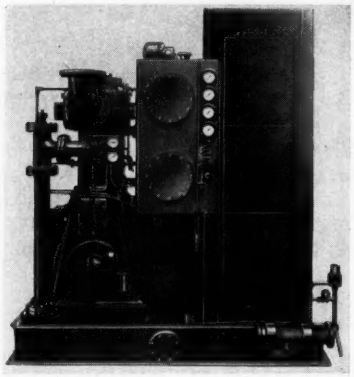
USE REPLY CARD—CIRCLE No. 5

Fluid-powered speed reducer, developed by Rucker Mfg. Co., 4228 Hollis St., Oakland 8, Calif., provides all conventional gear ratios. It offers complete control of motor speed from 0 to 2000 rpm at constant torque and with full reversibility. Specially-designed hydraulic motor replaces the conventional electric motor as a power source. Fluid-powered unit is explosion proof and absence of rheostat, belts or gears to shift indicates simplified operation. Reducer is made in sizes to 100 hp input; larger sizes are available to meet specific job conditions. Units available now are equipped with vane-type motors; those using piston-type will be available later.

Semi-Portable Oxygen Generator

USE REPLY CARD—CIRCLE No. 6

Joy Mfg. Co., Pittsburgh 22, Pa., offers a semi-portable oxygen generator designed to effect substantial saving for industrial users producing their own high purity oxygen. Essential part of the generator is a series of automatic reversing heat exchangers that eliminates chemical air purification and contributes to high efficiency. Having no dependence on chemicals, the unit consumes nothing but air and power to produce its high purity oxygen. Space occupied is about 600 cu ft (8 x 7½ x 10 feet). Models available range from 0.5 to 12 tons daily capacity of 99.5 per cent pure oxygen.



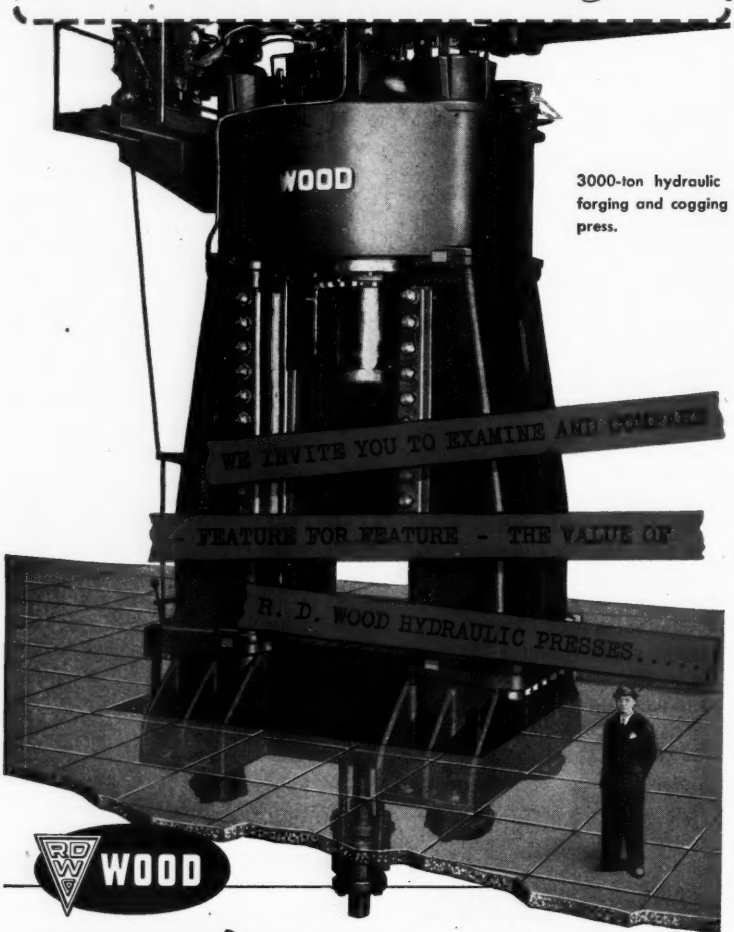
. . . consumes nothing but air and power

Tractor Tows 70-Ton Loads

USE REPLY CARD—CIRCLE No. 7

Hensel Green & Co., 9 S. Clinton St., Chicago 6, Ill., announce addition of the model 35 to their line of material handling tractors. Model measures 102 x 52 inches. Powered by the International Harvester 6-cylinder Silver Diamond engine, it moves trailer trainloads carrying a maximum 70 tons of loose or palletized materials. It also can be equipped with

If it's an **R. D. WOOD**... *It's Good**



3000-ton hydraulic forging and cogging press.

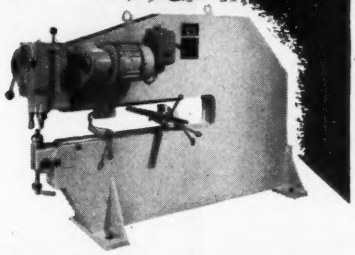
RDW WOOD

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE
ACCUMULATORS
ALLEVIATORS
INTENSIFIERS

R. D. WOOD COMPANY
PUBLIC LEDGER BUILDING, PHILA. 5, PA.
Established 1803

*Find out why. Send for your free copy of our new photographic book of plant facilities.

LOOK at what PULLMAX can do for you



Straight cutting, circle cutting, free hand cutting, slot cutting, beading, folding and many variations of these operations . . . *ALL ON ONE PIECE OF MACHINERY!* Easy to set up and change tools . . . handles wide range of materials such as mild or stainless steels, non-ferrous metals, mesh, plastic sheets, composition boards of all kinds. Write for descriptive catalog showing performance and data on all models.

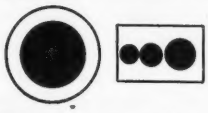
ALL THESE OPERATIONS ON ONE MACHINE

STRAIGHT CUTTING

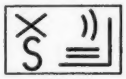
With straight cutting attachment, Pullmax performs as a straight shear. Cuts inside square holes. Can be used as a guide for other operations.

CIRCLE CUTTING

The Pullmax machine does not require a center hole for circle cutting. Simple, adjustable centering attachments cut circles quickly and accurately.



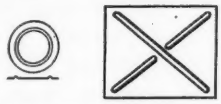
SLOT CUTTING



Slot cutting tools permit almost any slotting operation. Top tool in various sizes, lower tool adjustable.

BEADING

Special beading tools permit straight, circular, and irregular beads. Tools for special beads can be made in any tool room.



FOLDING

Standard size folding tools do straight, circular or irregular shape folds. Special tools easily made in any tool room.

LOUVERS and NIBBLING

Special attachments permit louver cutting and nibbling.

PULLMAX . . . "The complete sheet and plate working shop" . . . in one machine!

AMERICAN PULLMAX CO., INC.

2623 North Western Avenue — Chicago 47, Illinois

KELITE® REG U.S PAT. OFF POLY-KOTE

is the most advanced method of preparing iron, steel or aluminum for painting.

HERE'S WHY

1. POLY-KOTE removes light rust and oil in one operation.
2. POLY-KOTE prevents rust formation for substantial periods of time.
3. POLY-KOTE provides definitely superior bonding for paint.
4. POLY-KOTE is extremely inexpensive (1 gallon processes 5,000 square feet of metal.)
5. POLY-KOTE is supplied in concentrated form to cut shipping costs.
6. POLY-KOTE is easily maintained.
7. POLY-KOTE can be used equally well by immersion, spray-on or wipe-on application.
8. POLY-KOTE is non-toxic and non-flammable.
9. POLY-KOTE requires no special dips — such as chromic acid.
10. POLY-KOTE provides a coating with excellent plasticity.
11. POLY-KOTE gives superior resistance to rusting on painted surfaces.

WRITE TODAY!

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BERKELEY HEIGHTS, NEW JERSEY: Industrial Road

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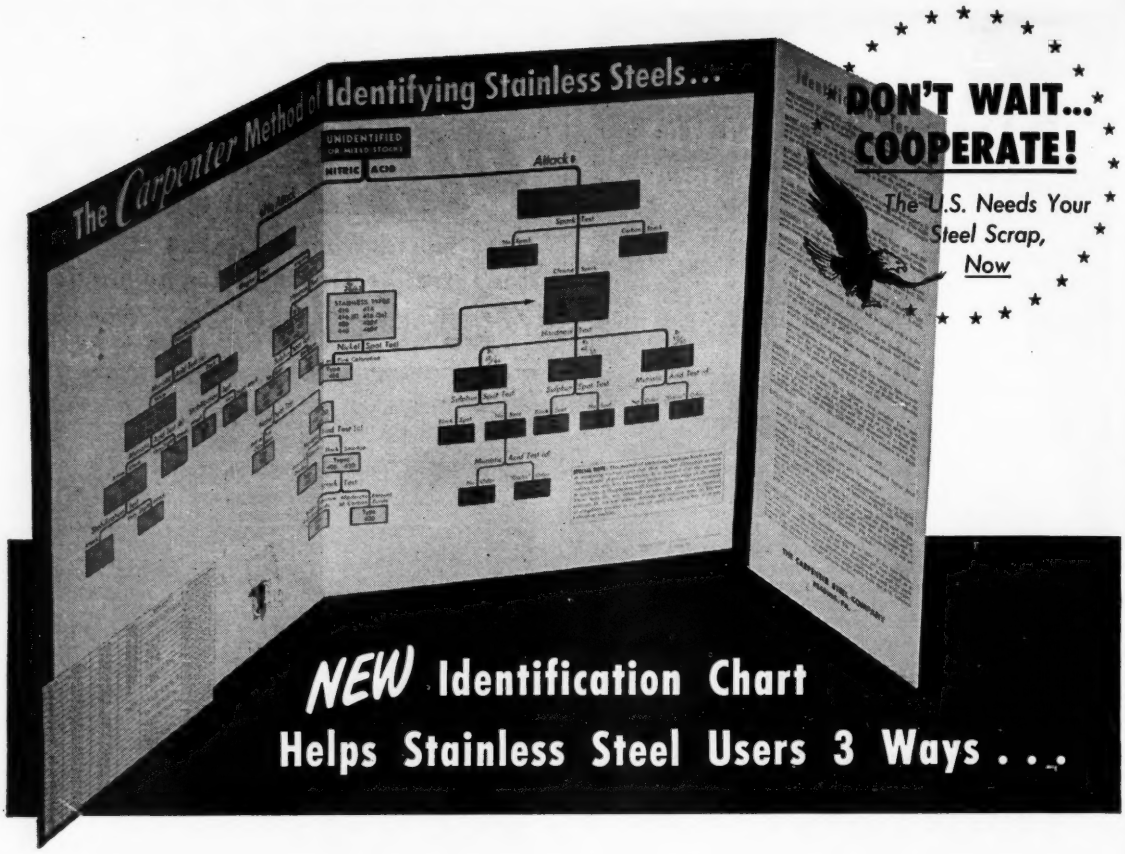
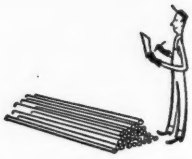

The Carpenter Method of Identifying Stainless Steels...
DON'T WAIT... COOPERATE!
The U.S. Needs Your Steel Scrap, Now
NEW Identification Chart
Helps Stainless Steel Users 3 Ways . . .

1

Separating Stainless Scrap: Use this chart to quickly segregate Stainless steel scrap for salvage . . . thus making the scrap more usable for industry, and increasing its value to you.



2

"Unscrambling" Mixed Stainless Stocks: The chart can help you save time getting Stainless stocks in order and reduce the danger of your men using the wrong Stainless for the job.

3

Preventing Trouble On The Job: If there is reasonable doubt as to the identity of the steel, use the chart before starting a job to double-check the type of Stainless to prevent troubles that could be caused by wrong treatment in fabrication.

Any user of Stainless steels will find this new Carpenter Identification Chart can save time, money and shop headaches by providing a quick method for identifying Stainless steels. The chart tells how to prepare the samples . . . then diagrams and explains fully how to use each of eleven different tests for identifying various Stainless types. Typical reactions are given for the nitric acid, magnet, spark, hardness, muriatic acid, sulphur spot, nickel spot and stabilization tests. Measuring 11" x 22", the chart is convenient to use right on the testing table. Carpenter offers this handy chart free to Stainless steel users. No obligation . . . just drop us a line on your Company letterhead. THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

It is assumed that the operator making the tests described in this Identification Chart will have some technical knowledge of the various alloys involved. The tests are not designed to supplant chemical analysis, but they are useful in separating various Stainless types that show marked differences in their chemical and physical properties.

Carpenter

more than corrosion resistance

STAINLESS STEEL

takes the problems out of production

a load carrying platform behind the driver's seat for individual rush deliveries of heavy parts or castings.

Tractor turns within a radius of 118 inches to provide maneuverability in crowded aisles and narrow shipping docks. Standard equipment includes pneumatic tires, but solid rubber cushion type can be ordered to meet certain traction conditions.

Loader Adjusts to Truck Sizes

USE REPLY CARD—CIRCLE No. 8

High-speed truck loader, made by Efficient Equipment Inc., 1621 W. Hastings St., Chicago 8, Ill., is a multipurpose unit that operates hydraulically. Loader is adjustable to any size dump truck. It consists of an attachable shovel or magnet, plus shop-box containers of various sizes weighing a maximum 3000 pounds. Loading unit is mounted on the rear of the truck body and operated by controls on the cab top. Auxiliary controls can be placed on the truck's side.

. . . multi-purpose unit loads hydraulically

Hydraulic loader arms work directly off power takeoff of the vehicle itself. Shovel or bucket holds 1 cu yd of loose material. The 29-inch magnet, operated by 5 kw generator, is used for picking up loose scrap. Attached to the arms, a set of heavy chains is used to hook shop-box containers.

Lathe Has 11-Inch Swing

USE REPLY CARD—CIRCLE No. 9

Tool room lathe, an 11-inch swing model with 1-inch collet capacity, is introduced by Logan Engineering Co., 4901 W. Lawrence Ave., Chicago 30, Ill. Machine's large headstock spindle is mounted in an improved casting. Spindle

To make YOUR product
work better . . . last longer
Use
FAIRFIELD
Gears
DESPITE all the care you lavish on the design and construction of your product, its successful performance may ultimately depend on a few, relatively small, gears. That's why it makes good sense to use only gears of *established quality*. FAIRFIELD GEARS have proved themselves "in use" on an almost limitless range of industrial products during the past 30 years. They are made-to-order—any type, and in a wide variety of sizes—to meet your special needs. *For the Best in Gears, Specify Fairfield!* Write for interesting, illustrated brochure.
Fine Gears made to order:
SPIRAL BEVEL • STRAIGHT BEVEL • HYPOID
HERRINGBONE • HELICAL • DIFFERENTIALS
SPUR • WORMS AND WORM GEARS
FAIRFIELD
MANUFACTURING CO.
for FINE GEARS
303 S. Earl Ave. Lafayette, Indiana

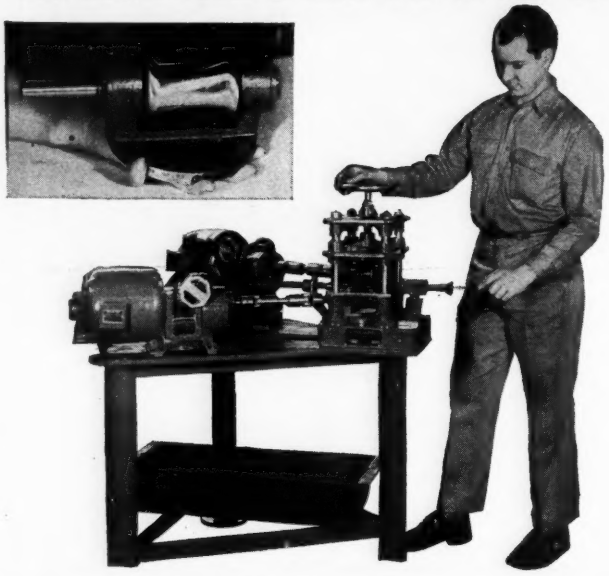
We Build Small Ones Too!

MEDART

No. 000 TWO-MOTOR TYPE

2-ROLL ROTARY STRAIGHTENER

FOR ROUND TUBES & BARS 1/16" TO 3/16" O. D.



- The smallest mill duty 2-roll rotary precision straightening machine made. Straightens, sizes, polishes and corrects out-of-roundness from end to end.
- Individual roll drive from variable speed motors equipped with integral speed reduction units, and interlocked for synchronization of roll speeds.
- Rolls made of Smavroc Alloy. Timken Bearing equipped.

Large Or Small—Medart Builds Them!

2-Roll Rotary Straightening, Sizing & Polishing Machines for tubes and bars from 1/16" to 9" or larger—or multiple-roll straighteners for pipe or thin-wall tubes up to 24". Whatever the straightening job, a Medart machine will do it *faster, better and at lower cost!*

Write For Catalogs

THE MEDART COMPANY 3535 DE KALB STREET ST. LOUIS 18, MISSOURI

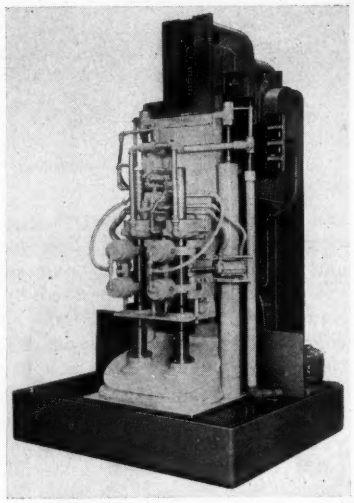
turns on a double and single row of precision ball bearings. Draw bar collet attachment is built in and supplied as standard equipment. Collet rack that clamps to the bed is also standard. Carriage has finished ground cross slide ways.

Redesigned compound swivel provides rigidity with positive locking. Reference marks on both right and left side of the 360-degree dial indicate fast, easy reading. Large dials on the cross and compound feeds are 3 and 2¼ inches diameter respectively, provided with instant adjustment. Cross slide and compound rest screws include thrust bearings for smooth, accurate movement.

Unit Machines Mortar Shells

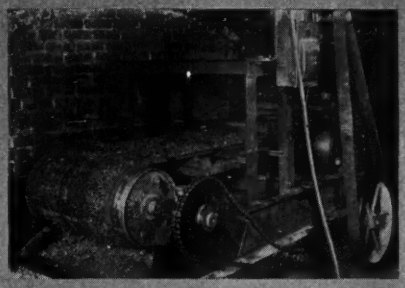
USE REPLY CARD—CIRCLE No. 10

Increased production on boring and counterboring operations on 4.2-inch chemical mortar shells is attributed to the model 30 HO



. . . bores, counterbores 56 parts per hour

boring machine made by Baker Bros. Inc., Toledo, O. Machine is high speed, heavy-duty, two-spindle inverted type, using hydraulic feed. Capacity is rated at 56 parts per hour at 100 per cent efficiency. Standard drills are No. 6 Morse taper with provision for use of pick-off speed change gears. Oilgear hydraulic feed pump is arranged for individual motor drive. Gear box, located at machine's base, is equipped with self-con-



Dings non electric pulley-type scrap separator in operation at a die cast plant.

Dings Extra-Powerful Self-Cleaning Rectangular takes iron out of shakeout sand.

Dings Cool Operating Lifting Magnet.

Dings "Hold Tite" magnetically holds castings in position for swing grinding.

4 MEANS TO GREATER EFFICIENCY

THE four Dings Magnets illustrated save time, labor, metals and money by doing their specific jobs more efficiently than any other method. Compare the advantages they offer over your present methods:

1 **FOR CRITICAL SCRAP SEPARATION** — Example: *A Non Electric, Permanently Magnetic Pulley Type Separator.* The magnetic PERMA-PULLEY, installed as head drive pulley in a completely self contained belt conveyor unit, takes iron out automatically, without attention, without electricity, without maintenance. Portable models available. Other types to meet any scrap separation requirement.

2 **A SAND HANDLING COST CUTTER** — *the Suspended Self Cleaning Rectangular.* Great power enables magnet to handle the particularly difficult iron extraction jobs. Self cleaning feature makes operation automatic, eliminates "carry-over" of sand with iron.

3 **THE IDEAL SCRAP LIFTING MAGNET** — Lifts more because it's cooler operating. Light weight, moisture-proof, rugged, 4-point chain suspension.

4 **"HOLD TITE" MAGNET CUTS GRINDING LABOR COSTS UP TO 25%** — Firmly holds all shapes of castings up to 1000 lbs. in position for swing grinding. Can be tilted to 7 different positions. Simple to install.

For details on any of the above magnets, use the coupon below.

SEND THIS COUPON
OR DROP A POSTCARD

Dings: Send me Catalog containing full information on: 4710

☐ Scrap Separators ☐ Lifting Magnet
☐ Rectangular ☐ "Hold Tite"

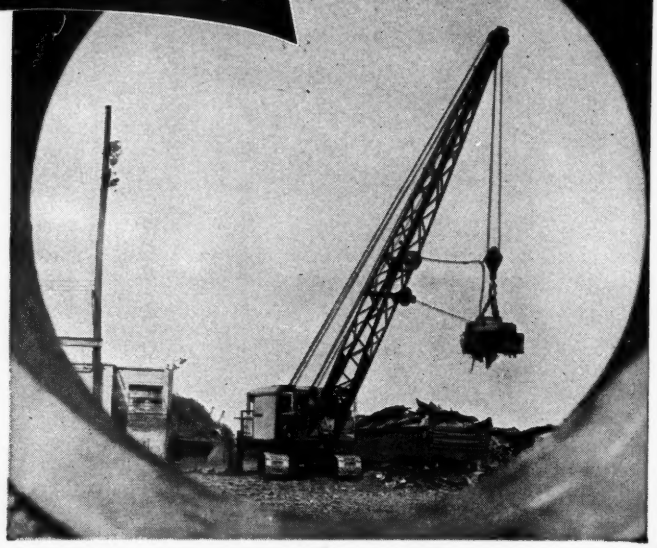
NAME_____

COMPANY_____

ADDRESS_____

Dings
MAGNETIC SEPARATOR CO.
4709 West Electric Avenue, Milwaukee 46, Wisconsin

GET IN THE SCRAP

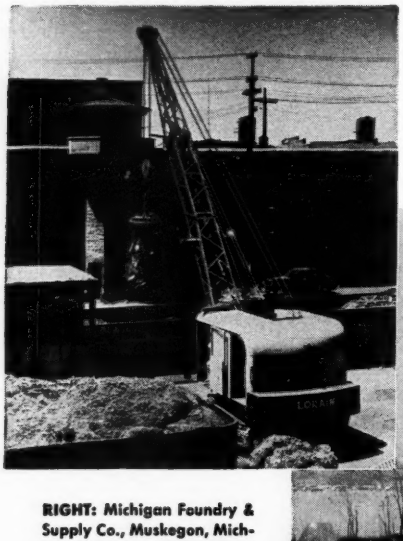


Lorains speed scrap handling for industry—cut material handling costs!

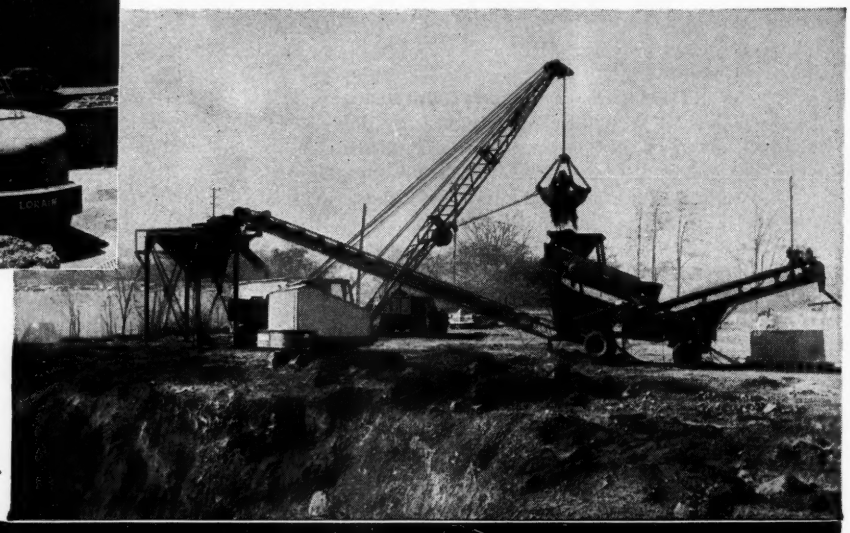
If you have wondered *how* Lorain Crane power can pay its way at your plant, take a look at these 3 Lorains. They are shown *getting in the scrap*—fast—to feed the mills and help ease the steel shortage for these three companies. But that's only one of the many chores Lorains perform for industry. You'll keep a Lorain busy every hour of the day—lifting, loading, unloading, handling every size, shape and type material from sand—to scrap—to steel. Your cost-per-material-handling-job will be far less than hand labor methods, and you'll feed factory lines on schedule. Let your local Thew-Lorain Distributor point out the many advantages of a Lorain in your plant!

THE THEW SHOVEL CO., LORAIN, OHIO

ABOVE: Pittsburgh Ferrous Products Co., Glassport, Penna. uses a big Lorain-820 Crane with magnet to load scrap steel into gondola cars. Lorain offers a wide selection of crane lifting capacities—from 6 to 45 tons.



LEFT: Columbus Bolt Forging Co., Columbus, Ohio load out steel turnings with their Lorain 50-I magnet-equipped crane. More than 16 various types of attachments are available to handle hundreds of types of material.



RIGHT: Michigan Foundry & Supply Co., Muskegon, Michigan work their Lorain TL25-K as a clamshell to "mine" precious scrap from an old slag dump. Lorains are available on crawler or rubber-tire mountings for any travel condition.

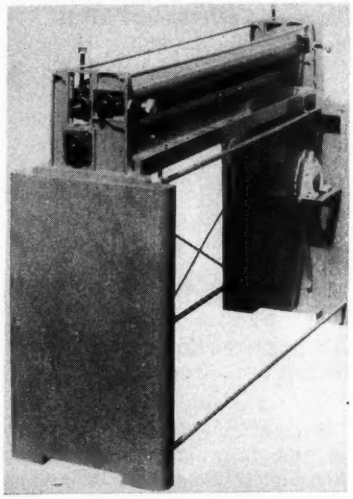
THEW **LORAIN**® CRANES FOR INDUSTRY

tained lubricant pump for lubricating gear train and bearings.

High Speed Industrial Coater

USE REPLY CARD—CIRCLE No. 11

Coats up to 3800 linear feet per hour or 15,000 sq ft 48 inches wide per hour are made by an industrial coating machine available from L. R. Wallace & Co., 440 Seaton St., Los Angeles 13, Calif. Machine is made for covering flat surfaces such as sheet metal, with lacquers, paints, protective coatings, etc. Coater rolls have 3-inch steel core with ½-inch neoprene molded ground coating. Wide double-strand hardened and ground roller chain drives all rolls. Rolls run in ball bearings throughout. Ball bearing take-up adjustment used throughout is self-aligning. Unit is powered by a ¼-hp motor.



. . . covers about 3800 lineal feet per hour

Backspotfacer for Cylinders

USE REPLY CARD—CIRCLE No. 12

Snyder Tool & Engineering Co., 3400 E. Lafayette, Detroit, Mich., announces a special-purpose machine for backspotfacing twenty cylinder mounting holes in cylinder barrels and head assembly for radial aircraft engines. Cutters are mounted in four radially moving segments, each containing five cutters which form a circle when cutters are moved into working position. Segments are actuated hydraulically.

Part is located and clamped manually into the fixture mounted on heavy guide bars. Driver head is advanced manually until cutters are engaged by the drivers. When work cycle is started, fixture with the part feeds into the cutters until the cut is completed

Conveyor Handles Varied Parts

USE REPLY CARD—CIRCLE No. 13

Gravity conveyor with special wheel arrangements and spacing to handle a variety of products is offered by Rapids-Standard Co. Inc., Dept. SRW, 342 Rapistan Bldg., Grand Rapids 2, Mich. Included are models designed to handle small tote boxes, cylindrical products, and small parts. Tote box conveyor handles small wire or metal tote boxes with stacking chimes. Unit is available with steel, aluminum or rubber wheels mounted on 4-inch side frames that serve as guard rails. Trough conveyor used for cylindrical products, can be obtained with steel, aluminum, rubber or Neoprene wheels spaced as desired. Its width is optional.

Just because that bathing suit is proper at the beach, she shouldn't assume it's proper for the classroom, too!

And just because one bearing is best lubricated by one particular grade of oil, you shouldn't assume that the same oil is best for *all* bearings on that machine. In many cases it isn't.

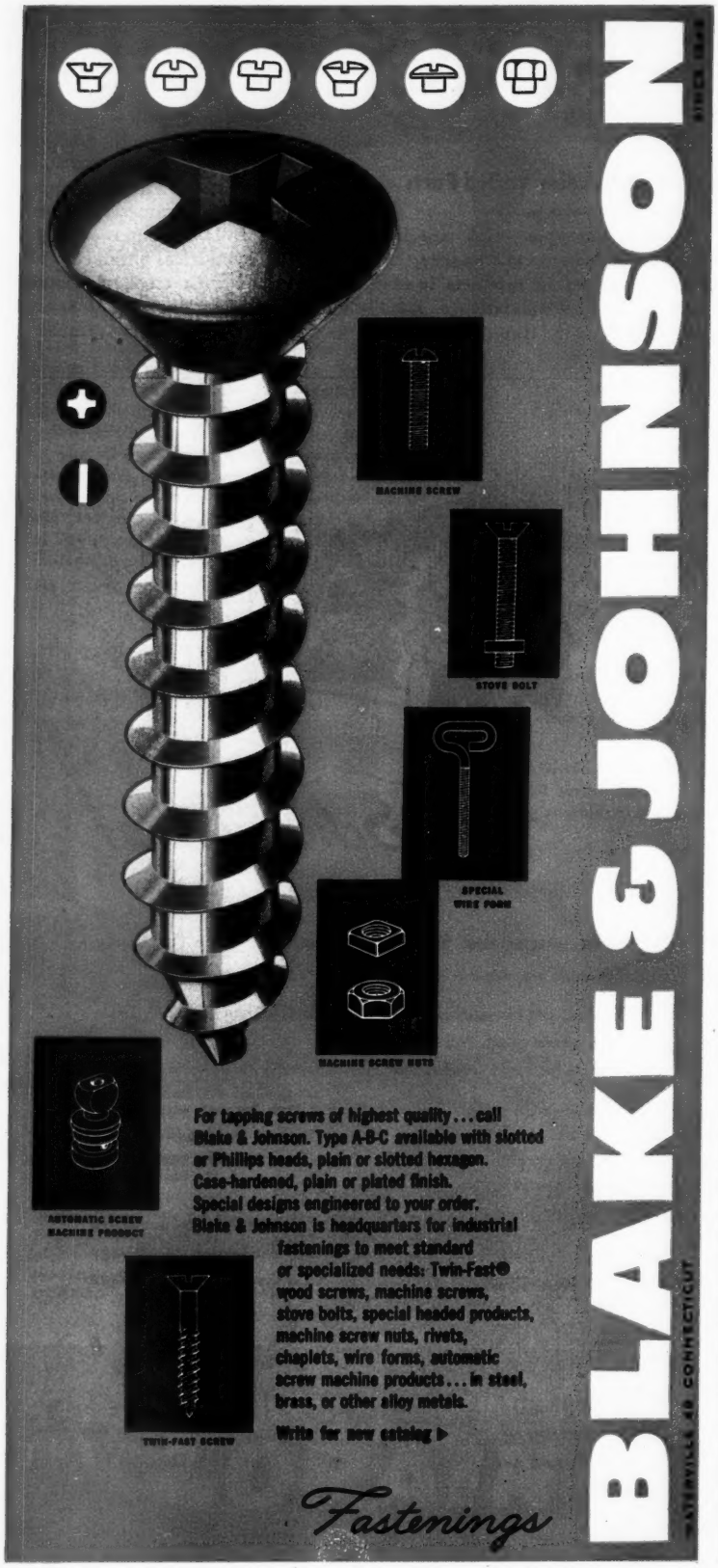
OIL CUPS permit you to lubricate each bearing with the oil best suited to that bearing—thus prolonging bearing life, reducing maintenance costs, cutting down-time, boosting production. And oil cups fortunately *cost very little.*

Gits oil cups have been the standard for industry for more than 40 years. Gits Bros. has the largest selection of oil cups available anywhere. Call on Gits Bros. for a prompt, efficient solution to your lubrication problems.

Write for free Catalog No. 60-A

GITS BROS. MFG. CO.

1844 S. Kilbourn Ave. • Chicago 23, Illinois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MACHINE SCREW
STOVE BOLT
SPECIAL WIRE FORM
MACHINE SCREW NUTS
AUTOMATIC SCREW MACHINE PRODUCT
TWIN-FAST SCREW
For tapping screws of highest quality... call Blake & Johnson. Type A-B-C available with slotted or Phillips heads, plain or slotted hexagon. Case-hardened, plain or plated finish. Special designs engineered to your order. Blake & Johnson is headquarters for industrial fastenings to meet standard or specialized needs: Twin-Fast® wood screws, machine screws, stove bolts, special headed products, machine screw nuts, rivets, chaplets, wire forms, automatic screw machine products... in steel, brass, or other alloy metals.
Write for new catalog
Fastenings
WATERVILLE 49 CONNECTICUT

Fence conveyor handles small parts in operations where fences are needed to divide conveyor widths into two or more lanes. Height of side members and divider fences is optional. Laned conveyor has two center rows of wheels arranged to form an open channel for handling mortar shells or similar cylindrical products. This spacing does not interfere with handling wide sheets or other materials on the same conveyor.

Diamond Cutters Mark Steel

USE REPLY CARD—CIRCLE No. 14

Cutters made with diamonds faceted to a sharp point are offered by H. P. Preis Engraving Machine Co., Hillside, N. J., for marking to a depth of 0.005-inch. Panto cutters are available in straight and tapered shank styles and can be used in any engraving or routing machine adaptable to these types.

Air-Operated Holding Fixture

USE REPLY CARD—CIRCLE No. 15

An air-operated collet holding fixture of compact size to permit multiple installation on production indexing tables, is available from Modernair Corp., San Leandro, Calif. It uses standard shop collets 1A and 3C styles up to ½-inch capacity. Its design allows handling of long pieces through entire fixture without interference to capacity.

Constant Support Type Hanger

USE REPLY CARD—CIRCLE No. 16

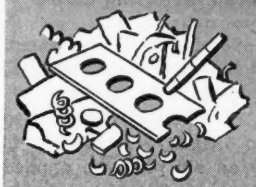
Bergen Pipesupport Corp., New York 7, N. Y., announces a constant support type hanger to properly support piping and equipment subject to large vertical movements without introducing additional stresses to the piping system. It uses one compression spring and needs no compensating device. Unit is offered in 25 sizes.

Timed Operations Preselector

USE REPLY CARD—CIRCLE No. 17

Cat. 125 timed operations preselector, made by Henry G. Dietz Co., Long Island City, N. Y., provides for adjusting the timing of each cycle of a process independently. It can be used to energize a number of electrical devices or circuits

HOW THE *SCRAP* THAT JACK MADE —MADE JACK *AND MORE*



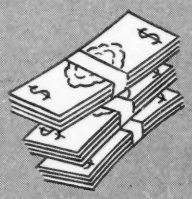
This is the Scrap that Jack made.

This is the Man who found the Scrap that Jack made.

This is the Clerk who was called by the Man who found the Scrap that Jack made.

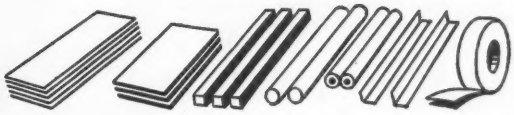
This is the Dealer who dealt with the Clerk who was called by the Man who found the Scrap that Jack made.

AND TO MAKE THE STORY SHORTER:



This is the jack the dealer paid for the Scrap that Jack made.

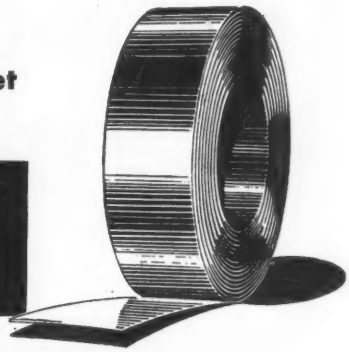
AND THIS IS THE STEEL THAT INDUSTRY GETS



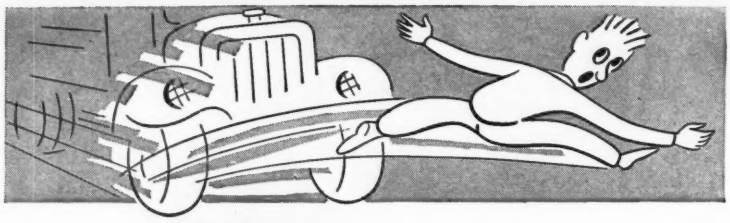
from the Scrap that Jack made!

MORAL:

Check your Plant for Scrap Today and Get it Moving—*That* Pays Everybody!



Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA



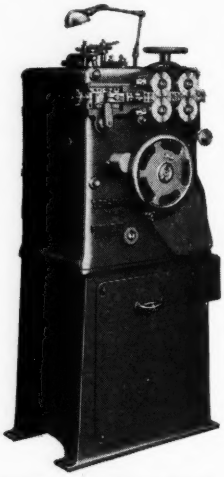
For the spring of your life

see the man with a

Versatile Torrington Spring Coiler

In spring coiling, the words "Torrington" and "Versatile" are synonymous! When you desire springs produced to meet exacting requirements, just call the professional springmaker who has a Torrington coiler. He's the man who can fill your needs with accuracy, speed and economy. On special springs, our sales department will gladly assist you in finding a source of supply, or help your springmaker devise just the right tooling to produce it.

Torrington's 14 different Spring Coilers cover a range of wire diameters from .003" to .750"



MODEL W-11 SPRING COILER

Wire diam. range: .015" to .072". Length per spring: 0" to 42". O. D. Coil Range: 3/32" to 1 9/16". Produces 23 to 190 springs per minute with variable speed drive. Extra wire feed gears, torsion, other attachments available.

NOW... Spring Makers and Users can get the same answers with The TORRINGTON SPRING TESTER

An accurate, uniform and inexpensive means of measuring spring load and deflection! For inspection or in-use testing . . . to aid in designing and developing springs for specific uses or as a basis for statistical quality control. Write today for illustrated bulletin on the Torrington Spring Tester!

The TORRINGTON MANUFACTURING COMPANY TORRINGTON, CONNECTICUT

during a single cycle of a process. Unit is an electrically operated device using no cams, clutches or other mechanical devices.

Air-Operated Mounting Clamp

USE REPLY CARD—CIRCLE No. 18

An air-operated mounting clamp, developed by Viber Co., Burbank, Calif., is designed to speed up attachment of external vibrators to load. No lengthy installation is necessary as air pressure applied to the clamp causes the jaws to grip securely to a suitable steel member such as an exposed angle.

Mechanical Fastener

USE REPLY CARD—CIRCLE No. 19

Link-Lock No. 1, a compact, all steel fastening device capable of exerting heavy pull down pressures has been developed by Simmons Fastener Corp., Albany, N. Y. It opens and closes with a twist of a wrench. It is designed for structural use, fastening panels, for large storage containers.

Electric Branding Iron

USE REPLY CARD—CIRCLE No. 20

Hexacon Electric Co., Roselle Park, N. J., announces a line of serial number electric branding irons. Irons have numerals 0 to 9 around the periphery of branding die and a space on face plate at end of die for additional branding copy if desired.

Adjustable Angle Fitting

USE REPLY CARD—CIRCLE No. 21

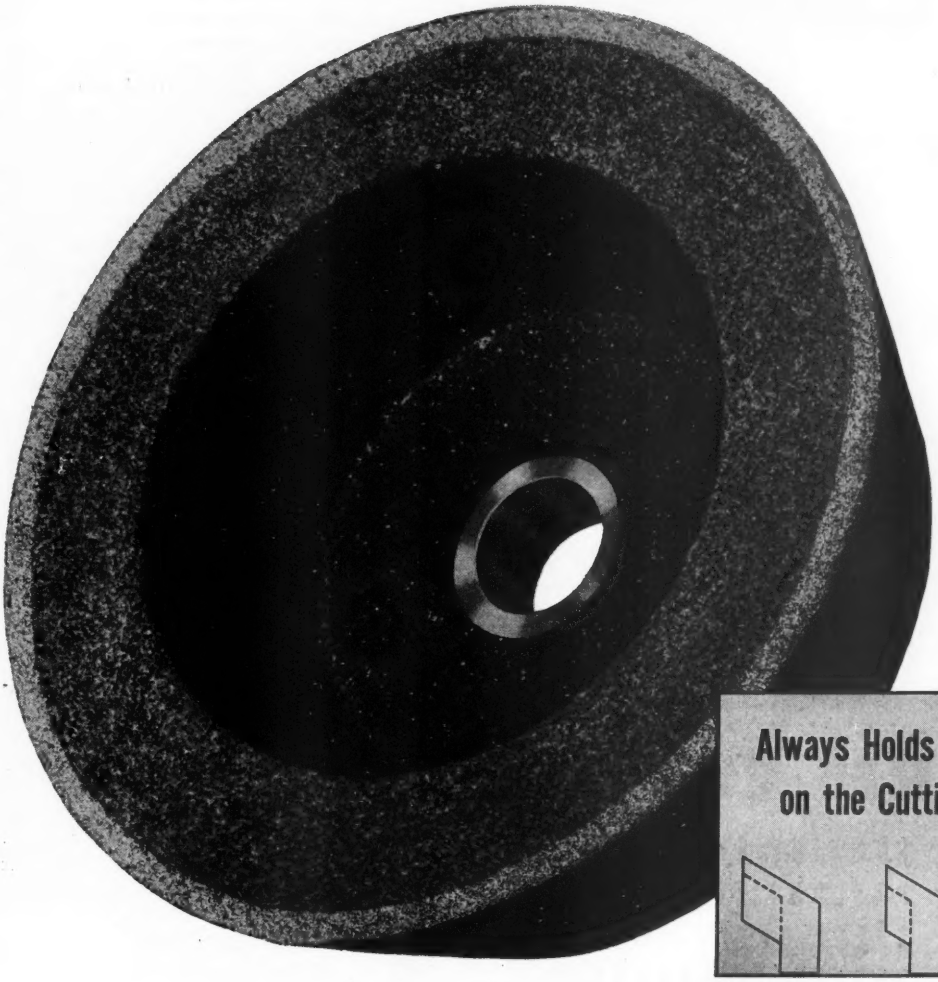
An adjustable angle fitting that permits accurate vertical suspension of overhead type electrical equipment from sloping or arched roof members is available from Thompson Electric Co., Cleveland 14, O. It is made in three types: Light duty, medium duty and heavy duty.

Industrial Electric Heaters

USE REPLY CARD—CIRCLE No. 22

Two improved Chromalox industrial electric heaters are announced by Edwin L. Wiegand Co., Pittsburgh 8, Pa. Type TBL electric tank heater includes a vapor-tight terminal box as a standard feature. Heavy duty tubular elements are welded to sealed, electrical connection housing and wiring is brought out to terminal box through a thick-walled steel pipe. Type ARMT screw-plug unit with

How U. S. Rubber improved cup wheels



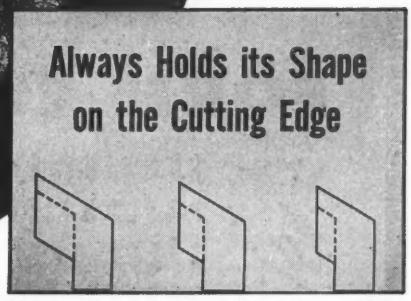


Diagram shows how the grinding face wears down evenly and the outer cutting edge remains sharp.

"U.S." technicians put an encircling rim, extra-tough and wear-resistant, around the free-cutting face of this Royalite® Hard-Shell Cup Wheel. As a result, the cutting edge does not become rounded. Hard-to-reach corners can be accurately ground because the edge does not break down. This free-cutting resinoid cup wheel retains its "true" shape throughout its entire service life.

Over 89 years' experience in the abrasive industry enables United States Rubber Company to solve all types of grinding problems. "U.S." engineers are always available for consultation. Write to address below.

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UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

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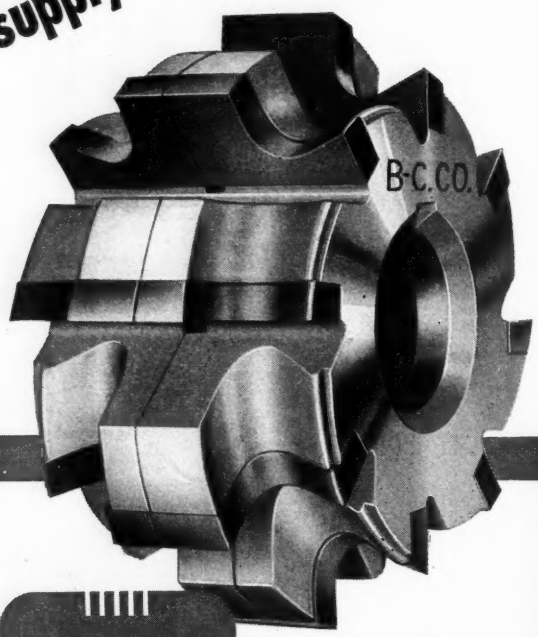

BARBER COLMAN *will design*

FORM CUTTERS

to

COMBINE CUTS
PROLONG TOOL LIFE
SPEED OPERATIONS
DUPLICATE ACCURACY
MAKE THE JOB EASIER

Complete Milling Cutter Service • Send Blueprints for Quotation

BARBER-COLMAN COMPANY
884 ROCK STREET
ROCKFORD, ILLINOIS

explosion-proof or vapor-tight terminal box is available with wider built-in thermostatic range.

Aluminum-Colored Sealer

USE REPLY CARD—CIRCLE No. 23

Minnesota Mining & Mfg. Co., Detroit 2, Mich., announces an aluminum-colored sealer that is applied to faying surfaces before spot-welding, eliminating the need for a sealing operation after welding. It does not interfere with the welding operation. Sealer shuts out air, dust and moisture, withstands paint oven temperatures up to 475° F and is not brittle at minus 10° F.

Parallel-Action Pliers

USE REPLY CARD—CIRCLE No. 24

Utica Drop Forge & Tool Corp., Utica, N. Y., offers two compound-leverage, parallel-action pliers. No. 402-6½ has a cutter and No. 400-6½ is without the cutter.

Reproduces Business Forms

USE REPLY CARD—CIRCLE No. 25

TelAutograph Corp., New York 23, N. Y., announces the Instan-Form telescriber. Business forms filled in on a transmitting telescriber are reproduced immediately on a similar form at one or more remotely located telescribers.

Flangeless Fasteners

USE REPLY CARD—CIRCLE No. 26

Tru-Set fasteners for consistency in anchoring in steel and concrete are available from Ramset Fasteners Inc., Cleveland 11, O. They are held straight in the barrels of powder actuated tools by an elasticized red tip. Tip pilots fasteners into the work.

Workholding Clamp

USE REPLY CARD—CIRCLE No. 27

By use of a torque converting ball bearing trunnion in the clamp offered by Centinela Industrial

USE A
REPLY CARD
Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

71. Welding Positioners

Reed Engineering Co.—Brief description, illustration, specifications and dimensional drawings pertinent to model P-25R medium duty welding positioners are presented in bulletin 79. Table embodies both power rotation and hand tilt systems. Power tilting is optional.

72. Heat Treating Furnaces

Loftus Engineering Corp.—Heat treating furnaces which are said to feature greater fuel economy, greater production, faster and more efficient operation are described and illustrated in 12-page catalog "Proven Heat-Treating Efficiency by Loftus." Installations covered include wire, shuffle-hearth, roller-hearth, car-type and shell, rocket and cartridge case furnaces and continuous heat treat lines.

73. Thermometers

Minneapolis-Honeywell Regulator Co., Brown Instruments Div.—Brown indicating and recording thermometers are described and their construction and engineering details given in 4-page illustrated specification sheet 600. Temperature ranges available include: —125 to 800° F; —10 to 600° F; and —40 to 1000° F.

74. Optical Inspection

Portman Instrument Co.—If you want to speed up optical inspection of irregular surfaces and contours, take a "look" at the vertical model C-100 Century optical comparator described in 4-page illustrated form K1. Comparator has 16 x 20-in. Sight-Line screen frame with 16-in. diameter image screen area.

75. Product Index

P. R. Mallory & Co.—Specific information in condensed form is contained in 12-page illustrated product index 0-1 on electrochemical, electromechanical, electronic and metallurgical products. Not highly technical, it is intended to acquaint engineer and layman with basic data on available products. Specifications, features and applications are included for batteries, capacitors, contacts, rectifiers, resistors, switches, vibrators, metals and ceramics, tuners and resistance welding supplies.

76. Tar Base Coatings

Pittsburgh Coke & Chemical Co.—Properties of four types of Pitt Chem cold-applied tar base coatings are described along with application directions in 8-page illustrated booklet No. PC4-252. Full-page chart lists selection of typical structures and corrosive agents and recommends coating best suited for each.

77. Steam Cleaning

Clayton Mfg. Co.—If you have steam, all cleaning is easy with the Clayton Hydro steam cleaner, according to 4-page illustrated form C-57.2 Bulletin lists advantages of this type cleaner, shows a typical Hydro installation, and gives specifications.

78. Precision Bearings

McGill Mfg. Co.—Bearing load computation data and charts of load formulas are among information included in 136-page precision bearing catalog. Factors influencing bearing selection are given. Each type of bearing made by company is detailed.

79. Tubing

Nikoh Tube Co.—Getting the right tube for your tubular product needs is the subject of 4-page illustrated bulletin 521. In addition to explaining tubing engineering and advisory service, booklet contains tabulation of round tubing weights per lineal foot for ⅜ to 4-in. diameter tube.

4-7-52

STEEL
Penton Building, Cleveland 13, Ohio

Please send literature or detailed information on subjects circled at left to—

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COMPANY _____

PRODUCTS MANUFACTURED _____

ADDRESS _____

CITY AND STATE _____

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4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
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BUSINESS REPLY CARD
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Penton Building
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Readers Service Dept.

80. Dumping Buckets

Penn Iron Works—Is your materials handling in the dumps? You can lick those handling problems with Penn dumping buckets. Types and sizes are available for every purpose. Get a copy of 36-page illustrated bulletin "Dumping Buckets" now. Full specifications and selection data are included.

81. Metal Washing Techniques

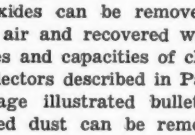
Oakite Products, Inc.—16-page illustrated booklet "8 Things to Look for When You Wash Metal by Machine" reviews advantages offered by specialized materials for use in metal washing machines and relates in detail the jobs they do. If your plant has metal cleaning operations, you'll profit by getting this guide.

82. Furnace Refractories

Mexico Refractories Co.—The 104 pages of illustrated catalog "Better Refractories for the Furnaces of Industry" describe the company's various brands of fire clay brick, high alumina brick, silica brick and refractory specialties. Data of brick available for most industrial applications are presented in tabular form. Estimating data, characteristics and valuable tables are included.

83. Too Dusty?

Everything from carbon black to metal oxides can be removed from exhaust air and recovered with various sizes and capacities of cloth-bag dust collectors described in Pangborn Co. 8-page illustrated bulletin 914. Recovered dust can be removed by wheelbarrow, truck or conveyor.



84. Hydraulic Circuit Designs

Logansport Machine Co.—Discussion of basic designs in fluid power circuits is presented in 32-page pocket-size manual "The Circuit Rider." Complete with drawings, manual offers down-to-earth exlanation of representative types of fluid power circuits and shows possibilities offered by use of different designs.

85. Hardening & Heat Treating

"Typical results of TOCCO Induction Hardening and Heat Treating" is series of studies citing applications and results obtained by proper application of induction heating equipment in various industries. In addition to describing actual operations, savings effected are given. The Tocco Div. of Ohio Crankshaft Co. will gladly send you a copy of Catalog 22, Section B.

86. Industrial Furnaces

Sargent & Wilbur, Inc.—Hot out of the oven is 4-page illustrated folder which describes model CM-12 conveyor furnace for continuous production bright annealing, brazing and hardening of stainless steel stampings, screw machine products and other small parts.

87. Pneumatic Tool Lubrication

New York & New Jersey Lubricant Co.—Guidance in the selection and application of lubrication for pneumatic tools and equipment is presented in 4-page illustrated bulletin No. 550. Advantages of using Non-Fluid oil for lubricating and rust-proofing tools are explained.

EDITORIAL REPRINTS:

88. Solution to Shortages

"Decontrolled Stainless: A Solution to Shortages" is title of illustrated STEEL reprint which suggests as a solution to fabricating problems the use of straight chromium grades of stainless which have been decontrolled by the NPA and no longer require CMP-4B tickets for purchase. Types of stainless are listed, and possible uses are covered.

89. Nondestructive Testing

X-ray fluorescence analysis is in the shop to stay, according to Fred Behr, author of STEEL reprint entitled "X-ray Fluorescence Analysis . . . Nondestructive Testing at Shop Level." He describes how this method for fast quantitative analysis of high alloy steels identifies each element in 3 to 5 minutes after specimens are prepared.

90. Die Spinning

Here's a brief but well illustrated STEEL reprint entitled "Precision Spinning Solves Ticklish Forming Problem" that spins a true yarn. Author B. Blackman relates how Riverside Metal Co. mass-produced from aluminum perfect spherical segments for dials on aircraft gyro indicators by combining watchcase spinning techniques and die stamping.

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Supply Co., Hawthorne, Calif., distorting, twisting action is eliminated. Trunnion also absorbs vibration. Saxton clamp is made in five sizes—1½, 3, 6, 9 and 12 inches.

Emery Wheel Dresser

USE REPLY CARD—CIRCLE No. 28

An emery wheel dresser designed to keep the grinding wheel face clean, sharp and cool is introduced by L. Newman, Oakland 7, Calif. It does not require resetting or resharpening. It frees the bond and eliminates checks in grinding wheel. All parts are replaceable.

Oil-Tight Control Station

USE REPLY CARD—CIRCLE No. 29

A control station in six, nine, 12 and 16 unit sizes featuring a hinged cover to facilitate wiring and maintenance is introduced by Square D Co., Milwaukee 12, Wis. Designed for machine tool service, cast enclosure is provided with a composition gasket between box and cover to insure an oil-tight seal.

Improved Solenoid Valve

USE REPLY CARD—CIRCLE No. 30

X5 type valve in the line of Skinner Electric Valve Division, Skinner Chuck Co., Norwalk, Conn., is same general design as V5 type. It includes top nut with increased thread engagement and is flanged to increase leakage path. Cap is machined from solid steel and is brazed to coil housing.

Protective Faceshield

USE REPLY CARD—CIRCLE No. 31

Improved vision, elimination of dead air space and relief from binding discomforts are some features of the protective faceshield assembly offered by Mine Safety Appliances Co., Pittsburgh 8, Pa. It is supported by adjustable neck and chest straps that provide balanced weight distribution.

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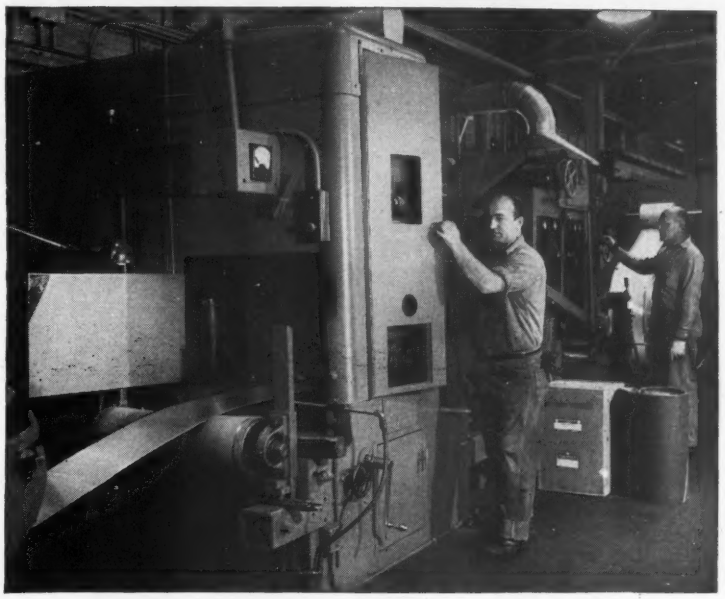
Manufacturer Cuts Costs 50%



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SCOVILL BRASS

CONTINUOUS-CAST
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Superior soundness and ductility of Scovill Strip and Sheet increase your working limits, promote maximum tool life, permit sharp bends, and extra deep draws as normally associated with each specific alloy.

Your machines can operate at highest permitted production speeds because of the uniformity of chemical composition, temper, and thickness from strip to strip and sheet to sheet throughout each unit length. Machine slowdowns or shut-downs from common metal irregularities are held to the minimum.

You benefit because Scovill uses all the facilities of copper-base metallurgical and chemical knowledge plus most modern quality control systems on all operations.

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BRASS MILL PRODUCTS IN A COMPREHENSIVE RANGE OF COMMERCIAL ALLOYS, SHAPES, TEMPERS AND SIZES

★ Scovill Manufacturing Company, 83 Mill St., Waterbury 20, Conn. ★

The Market Outlook

THERE'S a renewed vigor in demand in some sectors of the steel market where slackness had either arrived or was on the way.

The pickup is noticeable particularly in inquiries from the automobile industry for cold-rolled sheets and from the construction industry for structural shapes.

You can credit this flurry to relaxation of some government controls.

Government restrictions on production of automobiles and appliances had cut the demand for cold-rolled carbon sheets far enough that premium price mills were feeling the pinch on their order books. Government restrictions on construction were bringing fears that demand for structural shapes would fall far below mill capacity in the latter part of this year.

SOMETHING TO WATCH—How far this renewed demand will spread and how long it will continue depends to a considerable extent on how well the increased production of automobiles sells and how much of the thwarted construction revives.

To begin with, at least, many postponed building projects are being brought off the shelf. The whole construction field, if left reasonably free from government restrictions, should offer a good and continuous market for steel products. The freer outlook for construction and arrival of good weather for outdoor work are adding to the already strong demand for concrete reinforcing bars and mesh. The country's roadbuilding needs give rise to the belief that demand for those two products may not ease for a long time yet.

CAUTIOUS—Simultaneously with the increase in demand for some of the steel products, the mills became cautious in accepting third quarter business. Facing a steelworkers' strike threat, they didn't want to book more tonnage than they might possibly be able to deliver in that quarter.

Impact of the defense program on the steel supply stands out particularly in the demand for bars and plates. From all indications, bar production will fall short of meeting consuming requirements at least through the third quarter. Defense contracts take a larger ratio of bars than most end-products of steel. Drawing heavily on the bar supply now is the growing military shell program.

Improvement in supply of light gage plates from continuous strip mills continues but the heavier and wider material from conventional plate mills falls far short of meeting demand.

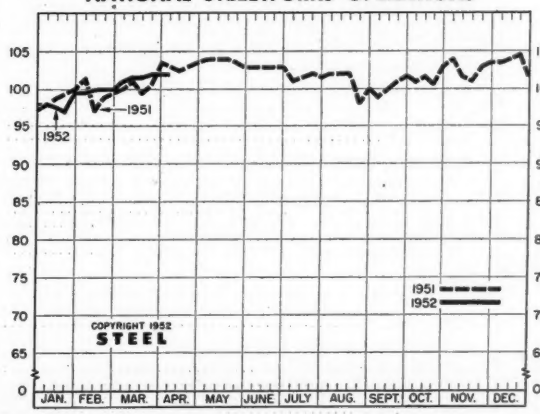
PRICES CUT—Warehouses continue to feel the easing that set in some time ago in the overall demand for steel. Their receipts of steel, particularly light flat-rolled material, are improving but not sufficiently to put inventories in complete balance. In one area where warehouse stocks of small cold-finished bars were long the price on that product was cut from $2 to $4 a ton.

Disappearance of some of the pressure for steel, along with improved scrap collections and a prolonged threat of a steelworkers' strike, have induced mills to be a little more independent and choosy in purchases of steelmaking scrap. Mills' inventories of scrap have been improving a little. High rate of scrap rejections at mills suggests that resistance to present ceiling prices is not far away. Such resistance would be following a pattern set some weeks ago by cast grades of scrap. Reduced need at foundries for this material has brought deep cuts in the amounts they are willing to pay. In some cases they aren't even willing to buy.

FAST PACE—Although the steel industry was jittery last week over threat of a steelworkers' strike it was making every effort to turn out all the steel possible. Its operations were scheduled at 102 per cent of capacity, unchanged from the preceding week. This rate would produce 2,120,000 net tons of steel for ingots and castings.

Prices for steel and related products remained unchanged except for cast iron scrap which is offered at prices sharply under government ceilings at most market centers.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Apr. 5	Change	Same Week 1951	Same Week 1950
Pittsburgh	104	+ 1.5*	101.5	99.5
Chicago	104	— 3*	106.5	101
Mid-Atlantic	99	0	100.5	89
Youngstown	103	0	104	100
Wheeling	101	+ 1	96	102.5
Cleveland	101.8	+ 2.8*	98.5	97
Buffalo	104	0	104	104
Birmingham	102	0	100	100
New England	84	+ 9	87	81
Cincinnati	94	0*	106	97
St. Louis	86.5	0	90.5	91
Detroit	106	— 1.5	103.5	107
Western	102	— 3	106	95
Estimated national rate	102	0	103	97

Based on weekly steelmaking capacity of 2,077,040 tons in 1952; 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 77 *Production-Engineering News—p. 113*

Composite Market Averages

FINISHED STEEL INDEX, Weighted:

	Apr. 3 1952	Week Ago	Month Ago	Year Ago	5-Yrs. Ago
Index (1935-39 av.=100)..	171.92†	171.92	171.92	171.92	118.67
Index in cents per lb.	4.657†	4.657	4.657	4.657	3.215
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32†	$106.32	$106.32	$106.32	$69.82
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	52.54	32.99
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	32.49
Malleable Pig Iron, GT ...	53.27	53.27	53.27	53.27	33.71
Steelmaking Scrap, GT	43.00	43.00	43.00	44.00	35.58

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

† Preliminary.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Apr. 3 1952	Week Ago	Month Ago	Year Ago	5-Yrs. Ago
Bars, H.R., Pittsburgh.....	3.70	3.70	3.70	3.70	2.60
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.60
Bars, H.R., del. Philadelphia	4.223	4.223	4.223	4.20	2.98
Bars, C.F., Pittsburgh.....	4.55	4.55	4.55	4.55	3.20
Shapes, Std., Pittsburgh...	3.65	3.65	3.65	3.65	2.50
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.50
Shapes, del. Philadelphia...	3.918	3.918	3.918	3.91	2.64
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.65
Plates, Chicago	3.70	3.70	3.70	3.70	2.65
Plates, Coatesville, Pa.	4.15	4.15	4.15	4.15	2.80
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.65
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.80
Sheets, H.R., Pittsburgh...	3.60–75	3.60–75	3.60–75	3.60–75	2.50
Sheets, H.R., Chicago	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh...	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago.....	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.55	3.35
Sheets, Galv., Pittsburgh...	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh....	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Strip, C.R., Pittsburgh.....	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.35	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.90	3.30
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.60	3.35
Wire, Basic, Pittsburgh ...	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.425
Nails, Wire, Pittsburgh ...	5.90-6.20	5.90-6.20	5.90-6.20	5.90-6.20	4.125
Tin plate box, Pittsburgh..	$8.70	$8.70	$8.70	$8.70	$5.75

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$66.00	$50.00
Wire rods, 7/32-⅜", Pitts...	4.10–30	4.10–30	4.10–30	4.10–30	2.675

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$34.00
Basic, Valley	52.00	52.00	52.00	52.00	33.00
Basic, del. Phila.	56.61	56.61	56.61	56.49	35.52
No. 2 Fdry, Pitts.	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	52.50	33.00
No. 2 Fdry, Valley	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, del. Phila. ...	57.11	57.11	57.11	56.99	36.02
No. 2 Fdry, Birm.	48.88	48.88	48.88	48.88	29.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.49	55.33	34.75
Malleable, Valley	52.50	52.50	52.50	52.50	33.50
Malleable, Chicago	52.50	52.50	52.50	52.50	33.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	40.50
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	188.00	140.25*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt. Pitts...	$44.00	$44.00	$44.00	$45.00	$38.00
No. 1 Heavy Melt. E. Pa...	42.50	42.50	42.50	43.50	36.00
No. 1 Heavy Melt, Chicago.	42.50	42.50	42.50	43.50	32.75
No. 1 Heavy Melt. Valley..	44.00	44.00	44.00	45.00	35.75
No. 1 Heavy Melt. Cleve...	43.00	43.00	43.00	44.00	35.25
No. 1 Heavy Melt, Buffalo.	43.00	43.00	43.00	44.00	36.00
Rails, Rerolling, Chicago..	52.50	52.50	52.50	52.50	39.00
No. 1 Cast, Chicago.....	49.00*	49.00*	49.00*	49.00*	42.50

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connlsvl...	$14.75	$14.75	$14.75	$14.75	$8.75–$9
Beehive, Fdry., Connlsvl...	17.50	17.50	17.50	17.50	9.75–11.00
Oven Fdry., Chicago	23.00	23.00	23.00	21.00	15.10

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	21.50
Zinc, E. St. Louis	19.50	19.50	19.50	17.50	10.50
Lead, St. Louis	18.80	18.80	18.80	16.80	14.80-14.85
Tin, New York	121.50	121.50	121.50	149.50	80.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex. ..	50.00	50.00	50.00	42.00	33.00
Nickel, refinery, duty paid.	56.50	56.50	56.50	50.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	59.18	59.68	....
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88	55.38	55.88	....
Syracuse, N.Y., del.	55.91	56.41	56.91	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	59.75	60.25	....
Fontana, Calif. K1	58.00	58.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
Los Angeles, San Francisco, del. ...	60.16	60.66	....	....
Granite City, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Geneva, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKees Rocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2.	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2.....	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.37
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Apr. 3, 1952; cents per pound except as otherwise noted. Changes shown in Italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$79.00
Munhall,Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston, S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala T2 .....56.00
Fairfield,Ala. T2 ....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y. B2 ..56.00
Munhall, Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duqusne,Pa. U5 ..56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 ....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah C11 .....66.00
Houston, S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14.66.00
So.Duquesne,Pa. U5 ..66.00
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 ....66.00
Conshohocken,Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston, S5 .....78.00
Ind.Harbor,Ind. Y1 ..70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2 ..70.00
Los Angeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14.70.00
So.Duquesne,Pa. U5 ..70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ...103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago,Ill. R2 ....82.00
So.Duquesne,Pa. U5 ..82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 .....$3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ....3.35

WIRE RODS
Alton,Ill. L1 .....4.40
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.90
Houston, S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ...4.35
Monessen,Pa. P7 ....4.30
No.Tonawanda,N.Y. B11.4.10
Pittsburg,Calif. C11 ...4.75
Portsmouth,O. P12 ...4.30
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 ....4.10
SparrowsPoint,Md. B2..4.20
Sterling,Ill.(1) N15 ...4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Worcester,Mass. A7 ....4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ...4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 ....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 ....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah C11 .....3.65
Houston, S5 .....4.05
Ind.Harbor,Ind. I-2 ...3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 ....4.85
Phoenixville,Pa. P4 ....5.90
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5 W14.3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 ....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 .....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa. (14) B2..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 ....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Ind.Harbor,Ind. I-2 ...5.50
Ind.Harbor,Ind. Y-1 ....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 .....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 ....4.65
Lackawanna,N.Y. B2 ..3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill U5 .....3.65

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 .....5.50
Lackawanna,N.Y. B2 ..5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 .....5.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah C11 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y-1 ....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 ....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ....4.85
Coatesville,Pa. L7 ....5.25
Conshohocken,Pa. A3 ..5.05
Fontana,Calif. K1 ....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 ....4.75
SparrowsPoint,Md. B2..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ..4.75
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 ....4.75

PLATES, Ingot Iron
Ashland,c.l. (15) A10...3.95
Ashland,lcl (15) A10 ...4.45
Cleveland,c.l. R2 .....4.30
Warren,O.c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky. (15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 ....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 ....4.15
Conshohocken,Pa. A3 ..4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif. (30) K1.4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 ....4.40
Geneva,Utah C11 .....3.70
Harrisburg,Pa. C5 ....6.30
Houston, S5 .....4.10
Ind.Harbor,Ind. I-2, Y1 3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5 W14.3.70
SparrowsPoint,Md. B2..3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 ....4.00
Youngstown R2, U5, Y1.3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 ....5.45
Geneva,Utah C11 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala, R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill. L1 .....4.15
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 ....4.40
Gary,Ind. U5 .....3.70
Houston, S5 .....4.10
Ind.Harbor,Ind. I-2 Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11.3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 ....3.85
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ....4.45
Youngstown R2, U5 ..3.70

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
Youngstown R2, U5....3.70

BAR SIZE ANGLES; H.R. CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 ....5.35
Gary,Ind. U5 .....4.30
Houston, S5 .....4.70
Ind.Harbor,Ind. I-2 Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2, U5, W14.4.30
So.Duquesne,Pa. U5 ....4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. I-2..5.55
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ...5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ....5.55
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....4.55
BeaverFalls,Pa. M12,R2 4.55
Buffalo, B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 .....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ..4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 .....4.55
Hammond,Ind. L2, M13.4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 .....5.10
Massillon,O. R2, R8 ....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 .....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 .....5.10
Readville,Mass. C14 .....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa. (5) K3..5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 ..4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12 ....5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ..5.40
Mansfield,Mass. B5 ...5.85
Massillon,O. R2, R8 ...5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 .....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts,(3,4) C2 ...4.75
ChicagoHts.(3,4) I-2 ...4.75
Franklin,Pa. (3,4) F5..4.75
FortWorth,Tex.(26) T4.4.85
Huntngtn,W.Va.(3) W7.5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda(3,4) B12 ..4.75
Williamsport(3) S19 ...5.00
Williamsport,(4) S19 ...5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover,(Eng.Bolt) U1 ..13.50
Dover,(Wrgh.Iron) U1 12.25
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy,(Staybolt)B14 12.20
McK.Rks.(Staybolt)L5 14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ..13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ...4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Ala. S5 .....4.10
Ind.Harbor,Ind. I-2 Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.15
Monessen,Pa. P7 .....4.30
Munhall,Pa. U5 .....3.70
Niles,Calif. P1 .....5.05
Phoenixville,Pa. P4 ....5.90
Portland,Oreg. O4 .....4.65
Seattle B3 .....4.60
So.Chicago,Ill. R2 .....3.70
So.SanFrancisco B3 ....4.45
SparrowsPoint,Md. B2 ..3.70
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Youngstown R2, U5 ....3.70

BARS, Reinforcing
(Fabricated; to Consumers)
Huntington,W.Va. W7 ..5.50
Johnstown,¼-1" B2 ...4.75
LosAngeles B3 .....5.45
Marion,O. P11 .....5.00
Seattle B3, N14 .....5.55
So.SanFrancisco B3 ....5.45
SparrowsPt, ¼-1" B2 ..4.75
Williamsport,Pa. S19 ...5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala, R2 ..3.60
Ashland,Ky.(8) A10 ....3.60
Butler,Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken,Pa. A3 ..4.00
Detroit, M1 .....4.40
Ecorse,Mich. (8) G5 ..3.80
Fairfield,Ala. T2 .....3.60
Fontana,Calif. K1 .....4.55
Gary,Ind. U5 .....3.60
Geneva,Utah C11 .....3.70
GraniteCity,Ill. G4 ....4.30
Ind.Harbor,Ind. I-2, Y1.3.60
Irvin,Pa. U5 .....3.60
Lackawanna,N.Y. B2 ..3.60
Munhall,Pa. U5 .....3.60
Niles,O. N12 .....5.25
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 ..3.60
Steubenville,O. W10 ....3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 .....3.60
WestLeechburg, Pa. A4 .3.75
Youngstown U5, Y1 ....3.60

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R. (14 ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ..5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
Ind.Harbor,Ind. Y1 ....5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ....5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 ....5.40
SparrowsPoint(36) B2..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 ....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.65
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1 7.05
IndianaHarbor,Ind. I-2..6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ...6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 ....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
Granite City,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (2S)	5.65
Niles,O. R2 (2S)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23)F4	6.85

SHEETS, Enameling Iron

Ashland,Ky(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland,Ky. A10.	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2.	5.60	5.85
Gary,Ind. U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16.	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2.	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths).	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower) Transformer Grade	72	65	58	52
Beechbottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va.W6	8.45	8.70
Yorkville,O. W10.	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEET, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32)B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.55
New Britain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	....	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	....	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	....	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W. Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65

Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

STRIP, Hot-Rolled Carbon

Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S3	5.85
Youngstown U5	5.50

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40)T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle,Pa.(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)	$15 16.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn,Conn.(10)	S15 10.75
Pawtucket,R.I.(11)	N8 10.75
Pawtucket,R.I.(12)	N8 11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

Wire, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19)K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora,Pa. A7	5.70	6.15
Duluth,Minn. A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.,Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.79	5.95
So.S.Fran. C10	6.85	7.10
SparrowsPt, B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt, B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill. L1	5.05
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8	5.10
Donora,Pa. A7	4.85
Duluth,Minn. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet,Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark, 6-8 ga. I-1	5.50
No.Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) N8	6.85
Trenton,N.J. R5	6.15
Worcester,Mass. A7	6.15
Worcester,Mass. T6	6.50
Worcester,Mass. W12	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE (16 gage)	Ani'd Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1)K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsville M8	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass. W12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill. L1	6.45
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth,Minn. A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	8.05
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill. R2	6.25
So.SanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Fine & Weaving (8"Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. M8	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	141
Atlanta A11	144
Bartonville,Ill.(19) K4	144
Crawfordsville,Ind. M8	146
Donora,Pa. A7	141
Duluth,Minn. A7	141
Fairfield,Ala. T2	141
Houston,Tex. S5	149
Johnstown,Pa. B2	141
Joliet,Ill. A7	141
KansasCity,Mo. S5	153
Kokomo,Ind. C16	143
Minnequa,Colo. C10	147
Monessen,Pa. P7	146
Pittsburg,Calif. C11	161
Portsmouth,O.(18) P12	148
Rankin,Pa. A7	141
So.Chicago,Ill. R2	137
So.SanFran.,Calif. C10	161
SparrowsPoint,Md. B2	143
Sterling,Ill.(1) N15	141

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville,Ind. M8	132
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill. L1	6.10
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth,Minn. A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	6.85
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½Ga.

	Col.
AlabamaCity,Ala. R2	127
Ala.City,Ala.,17-18ga.R2	214
Aliquippa,Pa.9-14½ga.J5	131
Atlanta A11	134
Bartonville,Ill.(19) K4	131
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Johnstown,17ga.,6" B2	205
Johnstown,17ga.,4" B2	208
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	139
Monessen,Pa. P7	136
Pittsburg,Calif. C11	154
Portsmouth,O.(18) P12	138
Rankin,Pa. A7	131
So.Chicago,Ill. R2	127
Sterling,Ill.(1) N15	131

FENCE POSTS

ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	140
Williamsport,Pa. S19	150

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.35

RAILS	Std. No. 1	Std. No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...(16)	4.00
Lackawanna,N.Y. B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

NAILS & STAPLES, Stock To dealers & mfrs. (7)

	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M8	122
Donora,Pa. A7	118
Duluth,Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. 10	7.35

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

AXLES

Ind.Harbor,Ind. S13	5.60
Johnstown,Pa. B2	5.60

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 YoungstownSheet&Tube

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

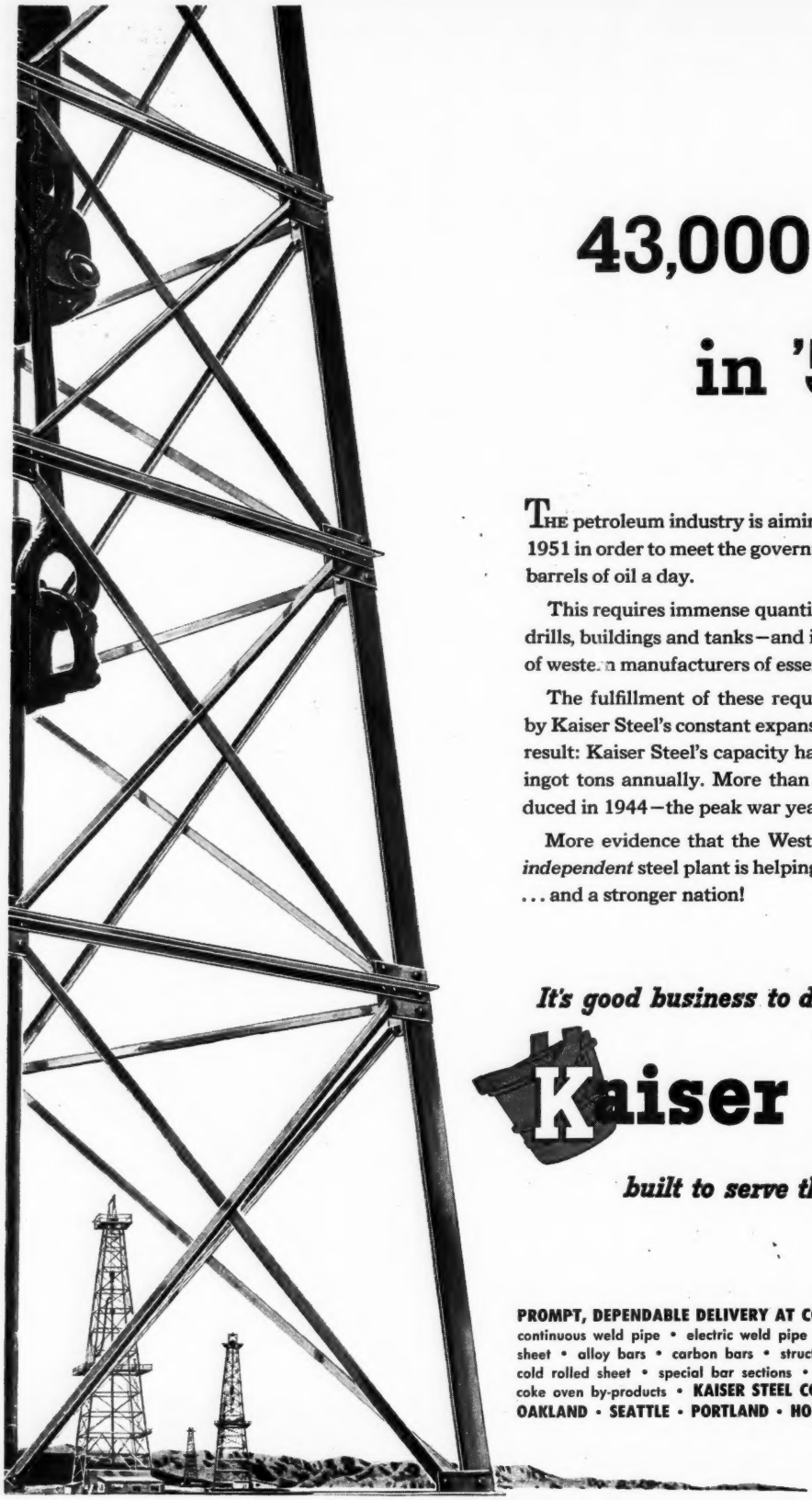
W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.650
20.25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	2.460
18.25	4.25	1	4.75	2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025

W	Cr	V	Mo	
6.4	4.5	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes:

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 60 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill. lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared: add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035": 0.035" and heavier. 0.25c higher.



43,000 more in '51!

THE petroleum industry is aiming at 43,000 new wells for 1951 in order to meet the government's goal of 7¼ million barrels of oil a day.

This requires immense quantities of steel—for derricks, drills, buildings and tanks—and is in addition to the needs of western manufacturers of essential civilian products.

The fulfillment of these requirements has been aided by Kaiser Steel's constant expansion of facilities. With this result: Kaiser Steel's capacity has now reached 1,380,000 ingot tons annually. More than *double* the amount produced in 1944—the peak war year!

More evidence that the West Coast's only integrated, *independent* steel plant is helping to build a stronger West . . . and a stronger nation!

It's good business to do business with

Kaiser Steel

built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates continuous weld pipe • electric weld pipe • hot rolled strip • hot rolled sheet • alloy bars • carbon bars • structural shapes • cold rolled strip cold rolled sheet • special bar sections • semi-finished steels • pig iron coke oven by-products • **KAISER STEEL CORPORATION** • **LOS ANGELES OAKLAND** • **SEATTLE** • **PORTLAND** • **HOUSTON** • **TULSA** • **NEW YORK**

STANDARD PIPE, T & C

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	...	+0.5	+2.5	...
¼	6.0	0.42	28.5	26.5	...	+3.5	+5.5	...
⅜	6.0	0.57	23.5	21.5	...	+10.0	+12.0	...
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	40.0	41.0	20.5	18.5	19.5
1½	27.5	2.78	42.5	40.5	41.5	21.5	19.5	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 36½ % on 3½", 4"; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜"; Wheatland, Pa, W9, 2 points lower on ⅛", ¼", ⅜". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼ % on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.
Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 4% on ⅛", plus 6% on ¼", plus 13% on ⅜" and 15.5% on 3½", 4"; Sharon, Pa. M6, plus 2.5 on ⅛". 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2" 2½" and 3"; Wheatland, Pa. W9, add 2 points on ⅛", ¼", ⅜", 1 point lower on ¾", 2 points lower on 1", 1¼", 2", 1½ points lower on 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 15½ % on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.
Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.
Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft. mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. in.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	12	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Cu Base Both Sides
302	....	....	....	....	19.75	26.24–27.50	77.00
304	25.00	29.50	....	....	24.50	27.50–27.77	77.00
309	30.50	35.00	....	....	....	....	....
310	36.50	41.00	....	....	....	....	144.00
316	29.50	34.00	....	....	26.00	35.92–36.56	....
317	34.50	39.00	....	....	....	....	....
318	33.50	38.00	....	....	....	....	....
321	26.50	31.00–32.00	....	....	23.00	33.00	111.00
347	27.50	32.00	....	....	24.00	33.50–33.83	130.00
405	21.25	27.75	....	....	....	....	....
410	20.75	27.25	....	....	....	....	....
Nickel	33.55	45.15	41.00	54.00	....	....	....
Inconel	41.23	54.18	....	....	....	....	165.00
Monel	34.93	46.28	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
½-in. & smaller diam. 15
⅝-in. & ⅞-in. 18.5
1-in. and larger .. 17.5
Longer than 6 in.:
All diams. 14
Lag bolts, all diams.:
6 in. and shorter ... 23
over 6 in. long 21
Ribbed Necked Carriage 18.5
Blank 34
Plow 34
Step, Elevator, Tap and Sleigh Shoe 21
Tire bolts 42
Boiler & Fitting-Up Bolts 31

NUTS

H.P. & C.P. Square:	Reg.	Hvy.
½-in. & smaller	15	15
⅝-in. & ⅞-in..	12	6.5
1-in.-1½-in. ..	9	1
1⅛-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in..	16.5	6.5
1-in.-1½-in. ..	12	2
1⅛-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in..	23	17.5
1-in. & 1½-in.	19.5	12
1⅛-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller..	35	28.5
6 in. or shorter:		
⅝-in. & ⅞-in. ..	29.5	22
1-in.-1½-in.	24	15
1⅛-in. & larger..	13	8.5
		Light
⅞-in. & smaller		35
1-in. to ⅞-in.		28.5
1-in. to 1½-in.		26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish .....48 & 10
Plated finishes ....31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged: per cent off list)

⅝-in. & smaller 42
¾-in. through 1 in.. 34
Longer than 6 in.:
⅝-in. & smaller 26
¾-in. through 1 in... 4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 38
1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS

(Packaged: per cent off list)

No. 10 and smaller ... 35
¼-in. diam. & larger.. 16
N.F. thread, all diams. 10

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.85c
7/16-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers....List to list-plus-$1.

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.
Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Diam.—Inches	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
	CARBON	
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.25	36.75	31.50
303...	43.25	40.25	34.00
304...	43.25	38.75	33.00
309...	56.00	55.00	44.75
316...	57.00	59.00	49.25
321...	49.25	48.25	37.00
347...	53.75	52.25	41.50
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25
502...	28.50	27.00	15.25

Balt., Types 301-347 sheet, except 303 and 309 E2.
Brackenridge, Pa., Sheets A4 quotes slight variations on Types 301-347.
Bridgeville, Pa., bars, wire, sheets & strip U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.
Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.
Cleveland, strip A7.
Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.
Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.
Duquesne, Pa., bars U5
Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.
Gary, Ind., sheets except Type 416 U5.
Harrison, N. J., strip and wire C18.
Massillon, O., all items, R2.
McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.
McKeesport, Pa., bars sheets except Type 416 U5.
Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars U5.
Pittsburgh, sheets C18.
Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.
Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.
So. Chicago, Ill., bars & structurals U5.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars U4.
Wallingford, Conn., strip W2 quotes 0.25c higher.
Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.
Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.
Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.
Youngstown, strip except Types 303, 309, 316, 416 501 and 502 and 34.25c on Type 301 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-35.00
Toluol, one deg...26.00-33.00
Industrial xylol...25.00-33.50
Per ton bulk ovens
Sulphate of ammonia .$32-$45
Cents per pound, ovens
Phenol. 40 (carlots, non-returnable drums) ..17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron Cents
98+% Fe, carlots.. 17.00
Swedish, c.l.f. New York, in bags..8.85-9.95
Electrolytic iron:
Annealed, 99.5% Fe, 42.50
Unannealed 99 + % Fe 36.50
Unannealed, 99 + % Fe (minus 325 mesh) 53.50
Powder Flakes 48.50
Carbonyl Iron:
97.9-99.8% size 5 to 10 microns..83.00-148.00
Aluminum:
Carlots, freight allowed 29.50
Atomized, 500 lb drums, freight allowed 32.50
Antimony 75.85
Brass, 20-ton lots.30.00-33.25
Bronze, 10-ton lots 51.25-60.00
Phosphor-Copper, 20-ton lots 50.00
Copper:
Electrolytic 37.25
Reduced 33.75
Lead 26.30
Magnesium 75.00-85.00
Manganese:
Minus 100-mesh ... 57.00
Minus 35 mesh 52.00
Minus 200 mesh ... 62.00
Nickel unannealed ... 86.00
Nickel-Silver 5-ton lots 45.00
Silicon 38.50
Solder (plus cost of metal) 8.50
Stainless Steel, 302 ... 83.00
Zinc, 10-ton lots..25.00-32.50

Tungsten	Dollars
Melting grade, 99%	
60 to 200 mesh:	
1000 lb and over ..	6.00
Less than 1000 lb..	6.15
98.8% minus 65 mesh:	
1000 lb and over ..	4.15
Less than 1000 lb..	4.25
Molybdenum:	
99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99% Cr. min.	3.50

METALLURGICAL COKE

Price per net ton

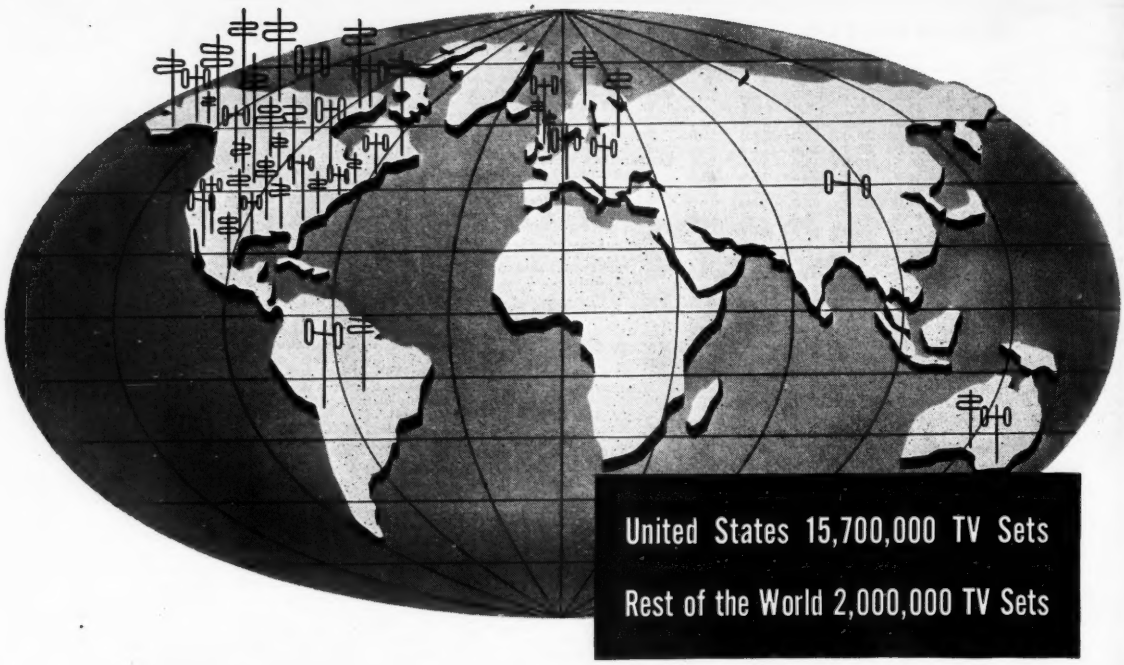
BEEHIVE OVENS

Connellsvll.fur. .$14.50-15.00
Connellsvll.fdy. ..17.00-18.00
New River foundry ...21.30
Wise county, foundry..15.95
Wise county, furnace..15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens..$22.75
Everett, Mass., Ovens New England, del. *24.80
Chicago ovens 23.00
Chicago, del. 24.50
Terre Haute, ovens ...22.50
Milwaukee, ovens 23.75
Indianapolis, ovens 22.75
Chicago, del. 26.42
Cincinnati, del. 25.85
Detroit, del. 26.85
Ironton, O., ovens 22.50
Cincinnati, del. 25.12
Painesville, O., ovens..24.00
Cleveland, del. 25.82
Erie, Pa., ovens 23.50
Birmingham, ovens....20.30
Birmingham, del. ...21.60
Philadelphia, ovens ...22.70
NevilleIsland,Pa.,ovens 23.00
Swedeland, Pa., ovens 22.60
St. Louis, ovens
St. Louis, del. 25.40
Portsmouth, O., ovens 22.50
Cincinnati, del. 25.12
Detroit, ovens 24.00
Detroit, del. 25.00
Buffalo, del. 26.89
Flint, del. 26.59
Pontiac, del. 25.47
Saginaw, del. 26.92

* Or within $4.15 freight zone from works.



COMPETITION Turns Luxuries into Necessities

Two millions of people throughout the world, washing machines, radios and television sets are miraculous inventions remote from their lives . . . for the wealthy only.

In the United States, however, a new product appears in no time in the homes of wage earners as well as salaried executives.

Consider television, for example. Only 6,500 sets produced in 1946 . . . over 5,000,000 in 1951. Or washing machines . . . more than 24,000,000 in 10 years.

What has Competition to do with this?

Do you think we'd continue to get more and better products if only one company made each item or each line?

No! We get more and better products here in America, because anybody who thinks he can make anything better or sell it more efficiently is free to try.

And many succeed. Take electrical products like radios and television sets . . . and home appliances like washing machines and electric fans. Does the biggest company monopolize this industry? Not by a long shot! Even counting all its affiliated companies, it still sells less than 1/5 of such products bought in this country.

There are nearly a thousand other companies that make home appliances, radios and television sets. And they do more than 4/5's of the business! The smallest of them make the biggest companies hustle their bones to keep making products better and better.

In America, a better product can always win consumer acceptance in any field.

Let's keep the COMPETITIVE SYSTEM working for us

The Competitive System can be killed! When industries are run by government, when taxes are so high that they destroy the incentive to work hard and risk savings in business ventures, the Competitive System languishes and dies.

You've seen it happen in other lands. Let's not let it happen here.

Let's all of us watch closely to see that those who represent us in government are working with us and for us to preserve our Competitive System; to assure a tax structure that leaves enough incentive to make hard work worthwhile, so that *any* man with ability and energy has a chance to earn good money and keep most of it.

Competition thrives best where the rewards are high. People live best where competition thrives.

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THE COMPETITIVE SYSTEM DELIVERS THE MOST TO THE GREATEST NUMBER OF PEOPLE

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§[5]		Carbon	Floor
New York (city)	6.40	7.11	8.55	7.05	...	6.49	7.29	9.28	6.37	6.74	7.98
JerseyCty(c'try)	6.16	6.91	8.25	6.75	...	6.19	6.99	10.48	6.07	6.44	7.68
Boston (city) ..	6.40	7.18	8.65	6.70	...	6.36	7.08	10.80	6.42	6.65	7.84
Boston (c'try) .	6.20	6.98	8.45	6.50	...	6.16	6.88	10.60	6.22	6.45	7.64
Phila. (city) ..	6.04	6.97	8.35	6.60	7.11	6.29	7.16	10.48	6.10	6.38	7.29
Phila. (c'try) .	5.79	6.72	8.10	6.35	6.86	6.04	6.91	10.23	5.85	6.13	7.04
Balt. (city) ..	5.74	7.00	8.40	6.23	...	6.21	6.83	...	6.33	6.33	7.57
Balt. (c'try) ..	5.54	6.80	8.20	6.03	...	6.01	6.63	...	6.13	6.13	7.37
Norfolk, Va. ..	6.78	...	...	...	...	6.04	7.30	...	6.30	6.30	7.15
Richmond, Va..	5.74	6.57	8.38	6.14	...	5.91	6.59	...	6.72	6.86	8.00
Wash. (w'hse).	6.05	7.26	8.49	6.50	...	6.50	7.26	...	6.60	6.65	7.86
Buffalo (del.)..	5.74	6.52	8.43	6.30	...	5.72	6.65	10.68††	6.02	6.18	7.58
Buffalo (w'hse).	5.54	6.32	8.23	6.10	...	5.52	6.45	10.48††	5.82	5.98	7.38
Pitts. (w'hse)..	5.50	6.32	7.85	5.59	6.90	5.45	6.20	10.30††	5.65	5.65	6.89
Detroit (w'hse).	5.79	6.50	8.47	6.15	7.15	5.74	6.64	10.45	6.09	6.14	7.21
Cleveland (del.)	5.74	6.52	8.16	5.85	7.14	5.82	6.60	8.91	6.15	6.02	7.39
Cleve. (w'hse).	5.54	6.32	7.96	5.65	6.94	5.62	6.40	8.71	5.95	5.82	7.19
Cincin. (w'hse).	5.84	6.38	8.29	5.77	...	5.75	6.64	10.49	6.09	6.14	7.28
Chicago (city).	5.74	6.52	8.05	5.69	...	5.67	6.50	10.30††	5.85	5.90	7.09
Chicago (w'hse)	5.54	6.32	7.85	5.49	...	5.47	6.30	10.10††	5.65	5.70	6.89
Milwau. (city).	5.90	...	8.21	5.85	...	5.83	6.81	10.46††	6.01	6.06	7.25
Milwau. (c'try)	5.70	...	8.01	5.65	...	5.63	6.61	10.26††	5.81	5.86	7.05
St. Louis (del')	6.02	6.80	8.33	6.56	...	5.95	6.88	10.58	6.22	6.27	7.46
St. L. (w'hse).	5.82	6.60	8.13	6.36	...	5.75	6.68	10.38	6.02	6.07	7.26
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans.Cty(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90[2]	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm(w'hse)	5.60	6.40	6.75[2]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city).	6.50	8.30[3]	9.50	6.60	10.65	6.45	8.35	11.50	6.50	6.50	8.75
L. A. (w'hse)..	6.30	8.10[3]	9.30	6.40	10.45	6.25	8.15	11.30	6.30	6.30	8.55
Seattle-Tacoma.	7.07	8.64	9.65	7.70	...	6.70	9.05	10.35	6.54	6.83	8.73
San Francisco..	6.64	7.88[3]	8.85[3]	6.43	...	6.72	8.20	11.15	6.45	6.50	8.30

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 16 gauge; †† as annealed; §§ 15 gage. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—3500 lb and over; [5]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	$20.00-24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	30.00-31.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom.

Rhodesian

45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00

Domestic—rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa.; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed, $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $186, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244, f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lots 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload, lump, bulk, 34c per lb of metal; packed, 34.75c; ton lots 36.25c; less ton lots 38.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 40,000 lb or more, 28c; 2000 to 39,999 lb, 30c; 250 to 1999 lb, 32c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65 - 68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lots 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30% max.) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth, $1.32; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth, Pa., $1.14, in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

NOTE: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 141, Mar. 31 issue; calcium, zirconium and briquetted alloys, page 167, Mar. 3. Refractories prices also were published on page 167, Mar. 3 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

Apr. 3	$43.00
Mar. 27	43.00
Mar. 1952	43.00
Apr. 1951	44.00
Apr. 1947	33.94

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	Grade 1 No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala..	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa..	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md..	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles Cut Structurals & Plate	+ 2.00
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.
(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.
(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.
(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.
(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.
(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.
(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or/steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.
(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.
(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise, ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery.	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.
(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3. For preparing into:
(4) Grade No. 25, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:
(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:
(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commission shall be payable to a broker in excess of $1.

Premium for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

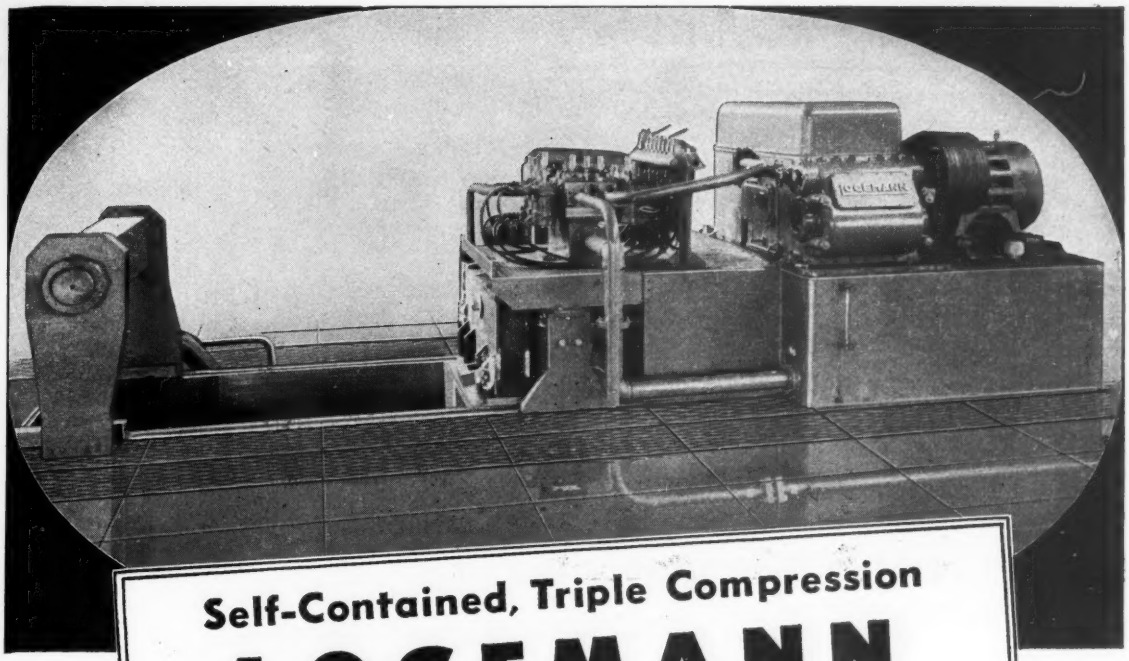
Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton: Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.
Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa. 53c; Buffalo, 83c; Butler, Pa., 65c.
Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c.
Coatesville, Pa., 50c; Conshohocken, Pa., 20c.
Detroit, 95c; Duluth, Minn., 50c.
Harrisburg, Pa., 51c; Houston, 57c.
Johnstown, Pa. 75c.
Kansas City, Mo., 78c; Kokomo, Ind., 51c.
Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c.
Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.
St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O. 51c.
Warren, Pa., 75c; Weirton, 70c.
Youngstown, 75c.

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory:	
Prep'd	33.00
Unprep'd	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	50.00

* F.o.b. shipping point.



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LOGEMANN SCRAP PRESSES

...give you compact, high density bales . . . at low cost!

LOGEMANN

Also specializes in

WASTE PAPER BALERS

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and in

HIGH PRESSURE PUMPS

. . . for pressures from 2000 to 50,000 p.s.i. for press operation, hydrostatic tests, and similar applications.

You Conserve Floor Space and Piping with this Compact Installation

Here is a combination of tried and tested units expertly assembled to reduce floor space requirements to a minimum. Features include a big box, high speed operation, and high density bales. Various box sizes are available to meet maximum scrap and minimum bale dimensions.

Also available are various sizes and types of pumps and operating valves to meet output requirements. Logemann Scrap Presses can be equipped with loading hopper in which the scrap charge can be prepared while the press is going through the operations on the preceding bale. Compressed bales are delivered at floor level for ejection to conveyor, steel chute, or into accumulation pit.

Write for Complete Details

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Three HAYSTELLITE inserts protect each of the blades on these two pug mill screws from the abrasive action of linoleum ingredients.

A handful of Tungsten Carbide Inserts gave this mixer an Extra Year of Life

Masticator blades in this pug mill-type mixer for processing linoleum failed in less than three months, because of severe abrasive wear. Much of this wear was eliminated by tack-welding three HAYSTELLITE cast tungsten carbide inserts to each of the blades on the screw. The inserts were applied easily without removing the blades from the mill.

After it was equipped with hard-faced blades, the mixer remained in service for nine months without blade maintenance, and it was still good for six months more. This five-to-one life more than offsets the cost of the inserts.

For more information on HAYSTELLITE tungsten carbide products and seven other HAYNES hard-facing materials, write for the 40-page booklet, "HAYNES Alloys—Hard-Facing Manual." The booklet contains data on how to select the right rod and how to make the deposit by either the oxy-acetylene or metallic-arc welding process.

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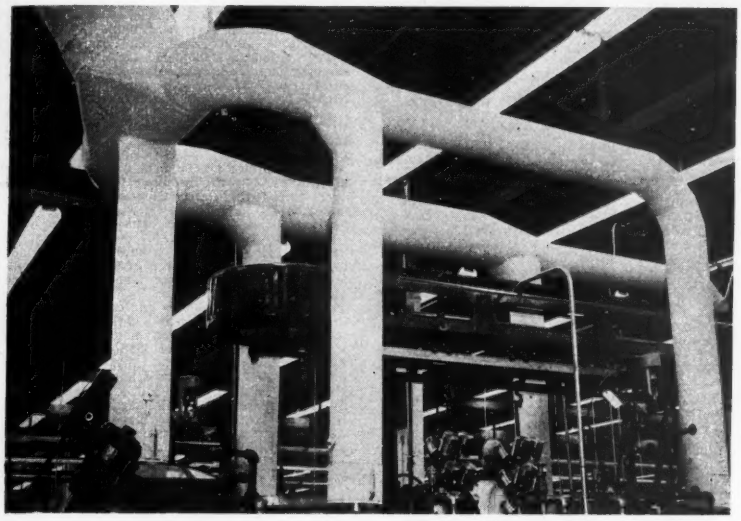

Monster Exhaust Stacks Overcome Plating Fumes

Arching grotesquely through a section of Chrysler Corp.'s new engine plant at Trenton, Mich., these exhaust stacks carry off fumes from a new automatic piston plating operation. Aluminum pistons are immersed in ten separate baths and rinses, including a 4½-minute dunking in a tin bath solution. They emerge with a coat of tin alloy approximately 40 millionths of an inch thick. Exhaust system collects fumes from tin plating and acid baths and hot water rinses. Machine plates 756 pistons per hour

Copper Price Hike Looms

High- cost mine concessions could be forerunner of contract for more of Chile's output at higher price. A general wage boost in the industry would force price relief by OPS

ODDS FOR copper price increase grow shorter with each new development on the domestic or international scene.

First step in crossing the price line would probably be a concession to Chile for the 20 per cent of its production that isn't allocated through the International Materials Conference. Once a deal there is made, howls from U. S. producers should force OPS to give relief.

The Balance Sheet— Viewed in toto, both Chilean and U. S. producers have good reason to ask for higher prices now. If wage developments in copper follow the bent of the steel negotiations, they'll have overpowering need for relief.

A flood of union demands will pour on the metals-producing industry in the wake of the steel settlement. Mine, Mill and Smelter workers want 25 cents an hour plus fringe benefits that would top the steelworkers' demands. Brass workers are agitating for a WSB decision that's been hanging fire since early fall.

Preliminary Step?—Bonus prices to high-cost U. S. mines may turn out to be the justification for an over-ceiling contract with Chile. Four of these agreements have been entered into thus far by DMPA. Seven mines with production of nearly 33 million pounds during the life of the contracts are affected.

The fourth of these contracts, signed last week, is for 1,195,000 pounds of electrolytic copper annually at 31.6 cents. The two-year contract is with Sam Knight Mining Lease Inc., operator of the Christmas Mine in Arizona's Banner Mining District.

Of Prices and Scrap—Copper scrap drives haven't been as successful as was expected. Chief reason is that there's little incentive to dig it up or turn it in at going rates.

Poor Timing—The pressure for a price hike comes at a poor time for copper producers. They're worried about the campaign for substitution that the government is waging and fearful of talk about the danger of depending on foreign metal supply.

Aluminum Deal Chances Fade

The proposed Canadian aluminum pact has lost much of its impact. Odds are overwhelmingly against any such deal—particularly since Congress won't take it up this year.

U. S. aluminum leaders can provide forceful arguments against the plan. It would have no immediate benefit to mobilization; need for the metal in 1959 is based on conjecture only. It could cause curtailment of U. S. capacity before Canadian in a plus market. The fundamental policy of the stockpiling program should be to pick up surplus aluminum in a soft market—and from domestic producers first.

Interior Secretary Oscar Chapman now frowns on the deal. Maintaining a strange silence on the subject is Jess Larson of DMPA, who would be in charge of the stockpiling.

Rate of primary aluminum production during February was slightly higher than in January. Because of fewer working days, total tonnage was about 9 million pounds below the previous month. The Aluminum Association calculates February primary output at 144,661,327 pounds.

Record Expenditures Planned

Nonferrous metals industries plan to spend over $500 million in 1952 on new plant and equipment, says the Securities and Exchange Commission. That's 92 per cent more than in 1951 and almost ten times the 1945 expenditures. Outlays in the second half of this year will be only slightly below first half rates, SEC estimates.

STEEL'S Metal Price Averages for Mar., 1952

(Cents per pound)

Electrolytic Copper, del. Conn.	24.500
Lead, St. Louis	18.800
Prime Western Zinc, E. St. Louis	19.500
Straits Tin, New York	121.50
Primary Aluminum ingots, del.	19.000
Antimony, f.o.b. Laredo, Tex.	50.000
Nickel, f.o.b. refinery	56.500
Silver, New York	88.000

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley, Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c, 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c, East St. Louis; high grade 20.85c, delivered.

Lead: Common 18.80c; chemical 18.90c; corroding 18.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 50.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 50.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $207-$210 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 88.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53, cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze 95%, 41.30; 90% 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90%, 43.79; red brass, 85%, 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass, 39.44.

(Base prices, effective Dec. 26, 1951)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 28.545; 30,000 lb lots, 28.67; l.c.l., 29.17. Weatherproof, 100,000 lb, 30.35; 30,000 lb, 30.60; l.c.l., 31.10. Magnet wire del., 15,000 lb or more, 34.50; l.c.l., 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4	—Round— 17S-T4	——Hexagonal—— R-317-T4	——Hexagonal—— 17S-T4
0.125	52.0	...	...	
0.156-0.0188	44.0	...	...	
0.219-0.313	41.5	...	...	
0.375	40.0	46.0	48.0	
0.406	40.0	...	...	
0.438	40.0	46.0	48.0	
0.469	40.0	...	...	
0.500	40.0	46.0	48.0	
0.531	40.0	...	...	
0.563	40.0	...	45.0	
0.594	40.0	...	...	
0.625	40.0	43.5	45.0	
0.688	40.0	...	45.0	
0.750-1.000	39.0	41.0	42.5	
1.063	39.0	...	41.0	
1.125-1.500	37.5	39.5	41.0	
1.563	37.0	...	...	
1.625	36.5	...	39.5	
1.688-2.000	36.5	...	...	

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $24.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $24.00 per cwt. Traps and bends: List prices plus 65%.

ZINC

Sheets 26.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 25.50-26.50c; over 12-in., 25.50-26.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 28.00c; 5 tons and over 28.50c; 1 to 5 tons, 29.00c; less than 1 ton 29.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb. 75.50c; 3000 to 10,000 lb, 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb. to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.375; 500 to 999 lb, $1.38; 200 to 499 lb, $1.385; less than 200 lb, $1.40. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material. Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment) Unsweated zinc dross, 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 19.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb, or a flat price of 11.25c a pound of battery plates. Used storage batteries (in boxes) drained of liquid, 7.65c for 15,000 lb or more; 7.45c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 17.25c in lots of 20,000 lb or more; 16.50c in lots under 20,000 lb.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Apr. 1-3	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Mar. 1-31	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Mar. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Feb. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg.	24.50	18.80	19.50	109.404	19.00	50.00	56.50	88.00
1951								
Dec. Avg.	24.50	18.80	19.50	103.00	19.00	50.00	56.50	88.00
Nov. Avg.	24.50	18.80	19.50	103.00	19.00	44.56	56.50	88.00
Oct. Avg.	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12
Sept. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Sheets, Strip . . .

Sheet and Strip Prices, Page 208 & 209

Cleveland—Some sheetmakers note a change in buying sentiment. Relaxing of production controls on consumer durable goods appears to be stimulating demand. The change is considered especially significant with respect to cold-rolled sheets which have shown noticeable easiness for some months past. Some of the renewed interest may be attributable to fear of a long-drawn out steel strike and higher prices, but this is believed secondary to the rise in actual requirements. The major producers chiefly are feeling the effects of this renewed interest with consumers still shying away from the so-called premium-priced mills. These latter are in need of tonnage to support operations through the latter part of second quarter. Sheet sellers in this area are booking cautiously for third quarter, most of them accepting tonnage only for July because of the possibility of disrupted scheduling in event of a steel strike. Little open galvanized tonnage will be available before late third quarter despite increased zinc allotments. Bulk of current galvanized sheet production is going to the warehouses under NPA M-6.

Boston—Outstanding defense demand for strip steel is for cartridge clips. Springfield armory is inquiring for 1000 tons and contracts have been placed with Wallace-Barnes Co., L. E. Zurbach Steel Co. and Washburn Wire Co. Civilian buying of cold-rolled strip is slow with deferments and cancellations affecting backlogs as many consumers adjust inventories. May schedules filled slowly and there are openings for June. Third quarter allotments of carbon sheets are heavier for civilian products with pressure to place orders somewhat stronger, partly due to steel strike threat.

New York—Despite spottiness in demand, leading sellers are well booked for the remainder of first half and look forward to third quarter with reasonable optimism. Even should the industry be spared a major strike, most sellers believe there will be sufficient improvement in demand for consumer durables to offset, in fair measure, adverse summer seasonal influences and to permit at least a moderately active third quarter.

Philadelphia — Sheet consumers probably will be able to withstand the effects of a steel strike better than users of other products as inventories are in better shape. Most sheet producers could keep operating fully throughout the second quarter if there is no prolonged strike. Operation of the new continuous zinc coating unit at Sparrows Point, Md., has started.

Pittsburgh—Books of district mills are open for third quarter and are just about filled for June. Producers see demand continuing firm into third quarter. There was a small carryover into second quarter amounting to a week's production on some mills. Galvanized, strip and long ternes are tight in this area.

Chicago—One sheetmaker indicates its sheetmaking facilities will be fully occupied through September. This applies to cold-rolled as well as hot-rolled. In some cases users seek tonnage in excess of quotas.

Birmingham—A slight slackening in demand for cold-rolled sheets was momentary with the result order books are as heavily loaded as ever.

San Francisco — With zinc allotments increased, producers expect to increase output of galvanized sheets.

Wire . . .

Wire Prices, Page 209

Boston—Galvanized wire demand is heavier than for most finished products. With mill schedules filled through June, orders are for supply replenishment, result of low allocations over an extended period. Wire rope, mesh and guard rail are seasonally more active, but improvement in merchant wire products is slow. Manufacturers' wire and most specialties are dragging and there are openings in some schedules for May. Industrial consumers are inventory-minded and in many cases have trimmed out forward commitments.

Birmingham—Output of wire products is moving as fast as it comes from the mills.

Steel Bars . . .

Bar Prices, Page 207

Pittsburgh — Third quarter books are filling rapidly. Demand is strong for all grades and sizes. Mills advise that material 1½-in. and larger —mainly forging grades—is in greatest demand. Carryover was large into second quarter and producers see no letup for the next five to six months. Bessemer bars seem to be on the way out as producers are now supplying resulphurized material produced in their open hearths.

New York—Carbon bar sellers are required under government regulation to open books for third quarter, but they are moving cautiously in their acceptances until the labor outlook becomes clarifed.

Boston—While electric furnace alloy supply has improved, overall backlog of bar producers is substantial with no indication of easing in third quarter. Some electric furnace aircraft volume extends into third quarter. There are few openings for open-hearth alloy stock. Converters are taking full allotments of hot-rolled, bulk of requirements being 2-in. and under. Forge shops continue to account for largest bar tonnage. Bolt and nut shops are operating with better balanced inventories.

Philadelphia—No real easing in carbon bar demand is evident. Pressure for the larger sizes is strong and even requirements for the lighter sizes continue in excess of supply.

Cleveland — In event of a steel strike of even limited duration, supply conditions with respect to bars will quickly become acute. Loss of production will result in shipment delays into third quarter, thus complicating scheduling for that period and the limiting of new bookings. Producers have opened books for third quarter but they are accepting orders cautiously, most of them only for July.

Chicago—From all indications production of bars will fall short of meeting consuming requirements through third quarter. Facilities for making quality bars are not adequate to accommodate demand.

Plates . . .

Plate Prices, Page 207

New York—Some plate producers have opened books for the entire third quarter, but others for only the first month of the period. Mills are moving cautiously in accepting tonnage until the steel labor controversey is settled.

Philadelphia—Plate mills are having difficulty keeping up with requirements for silicon steel. Much of this tonnage is in thicknesses 2-in. and over, but a new Navy specification goes down to gages no heavier than ⅞-in.

Boston — Low alloy, high tensile plates are among the tightest products with some producers sold through September. Demand is up sharply for bridges. Specifications have been revised generally to reduce use of nickel. Railroad car building and Bailey bridges account for substantial volume. Third quarter allocations on carbon plates have been set up with more narrow light sizes in sight. Several oil companies are planning increased tank storage facilities: The Atlantic Refining Co., Revere, Mass.; Gulf Oil Co., Providence and Burlington, Vt., and Shell Oil Co., South Portland, Me.

Pittsburgh — Mill books are open for third quarter with demand strong for all grades and sizes. Fabricators still clamor for tonnage, the supply situation not differing much from a few months back.

St. Louis—An influx of directives to Gulf Coast shipyards has cut into the area's supply of plates available to commericial users.

Birmingham — Demand continues strong for plates. Sizable tonnages are going to the Pascagoula plant of Ingalls Shipbuilding Corp.

Seattle—Portland has awarded the general contract for the 25.5 mile, 52 to 66-in. Bull Run water supply conduit to Kuckenberg Construction Co. on low bid of $4,974,675, involving 16,500 tons plates which, it is reported, will be fabricated by Beall Pipe & Tank Co., Portland. About 200 tons of plates, including shapes, are involved in two 120-ft tugs, rebids for which will be received by General Services Adm. for the Alaska Railroad, Seattle, Apr. 3.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 207

Boston—Heavier demand for concrete reinforcing bars and mesh has filled third quarter capacity, and substantial volume is booked beyond. Bridge substructures and deck work in Massachusetts account for 5000 tons with school and housing inquiry sustained.

Los Angeles—Relaxing of controls is bringing many postponed building projects off the shelf. Los Angeles Board of Education plans a vast $148 million construction program involving 62 new schools and additions.

Seattle—Rolling mills hold comfortable backlogs. Many small tonnages, largely school construction, are pending. Original estimate of 16,500 tons of reinforcing for the

Chief Joseph powerhouse project, bids in, was raised to 18,500 tons.

Tin Plate . . .

Tin Plate Prices, Page 208

Pittsburgh—Until the current steel wage price picture is clarified mills say no change in tin plate can be announced. Industry spokesmen think if a shutdown is avoided that the industry may secure some lifting of controls and liberalization of quota restrictions.

Tubular Goods . . .

Tubular Goods Prices, Page 211

San Francisco — The market for standard black pipe up to 4 in. diameter has eased considerably, while sizes more than 4-in. diameter still are in heavy demand. Galvanized pipe, all sizes, is in demand, particularly 4 in. and larger. Seamless and mechanical tubing are described as tight.

Seattle—Bids will be received by Seattle Apr. 8 for 2000 tons 16 and 20-in. cast iron water pipe. Inquiry for cast iron pipe is improving. Steel pipe is more active.

Rails, Cars . . .

Track Material Prices, Page 209

New York—The Pennsylvania railroad awarded six all-steel car flats, 330-ft in length and 38-ft beam, to the Staten Island, N. Y., yard of the Bethlehem Steel Co.

New York—While too early to definitely appraise the extent of orders for cars and locomotives, it appears business in rolling stock during March was heavier than in either of the two preceding months this year. In general the outlook is for improvement in April.

Structural Shapes . . .

Structural Shape Prices, Page 207

New York—Structural activity is quickening, reflecting easing in governmental restrictions. Several commercial jobs are active, including two sizable office buildings in the midtown section on which early awards are anticipated. Bridge work is taking an added spurt, including the placing of more than 25,000 tons for the West Virginia state throughway, divided about equally between Bethlehem Steel Co. and American Bridge Co. A municipal bridge in Brooklyn, involving 5680 tons, was placed with Bethlehem. Leading mills are booked solidly through first half and contemplate active operations in third quarter. The outlook for fabricators follows much the same pattern, most shops expecting full operations in second quarter and reasonably good production in the third. A prolonged steel strike, of course, would disrupt operations.

Philadelphia — Some fabricating shops will be forced to suspend operations within a month in event of a prolonged steel strike. One district fabricator last week signed a contract with the CIO union, full details yet to be announced.

Boston—Expected easing in structural steel supply in third and fourth quarters is not stimulating private commercial construction estimating much. Builders, however are urged toward advance planning due to extended lead-time necessary. Exceptions are power and light expansions. Bridge and direct defense inquiry is supporting demand with more liberal steel allotments releasing some projects.

Pittsburgh—Mills are booked to capacity for second quarter and expect good business to continue into the last half of the year. Hardest items to pick up are wide flange beams.

Cleveland — Strike of structural iron workers for a wage increase has temporarily tied up some construction in this area with resulting adverse effect on fabricators. Expectations, generally, are the strike will be shortlived. For that matter, government restrictions on commercial and industrial construction have held down the volume of such work to a low point in this district so that the tonnage of steel tied up by the strike is relatively small. Fabricators expect some pickup in demand as result of the loosening of government restrictions on building after midyear, but so far this easing up has not been reflected in any appreciable surge in demand.

Chicago — Structural fabricating shops are well occupied with some improvement in receipts of plain shapes noted. Despite relaxation in construction controls at midyear inquiries have not picked up appreciably.

Los Angeles—Easing of controls is bringing construction activity to boom levels. In February, valution of total construction in southern California increased 23 per cent over January levels.

Seattle—Fabricating plants are whittling backlogs but expect substantial new tonnages soon with many projects pending. While steel supplies are no easier indications are the situation will be improved by end of second quarter.

Semifinished Steel . . .

Semifinished Prices, Page 207

Pittsburgh—Pressure to achieve every possible ton of steel production before the anticipated steel strike deadline of Apr. 8, helped boost district operations 1½ points to 104 per cent of rated capacity from the previous week's revised rate of 102.5 per cent. The Wheeling rate went up one point to 101.

Iron Ore . . .

Iron Ore Prices, Page 213

Washington — Production of iron ore in the United States (all districts) last year totaled 116,430,000 gross tons, data collected by the Bureau of Mines show.

Of the total, the Lake Superior district contributed 93,950,000 tons or 80.7 per cent, the Southeastern district, 8,420,000 tons or 7.2 per cent, the Northeastern district 5,070,000 tons or 4.4 per cent, the Western district, 8,350,000 tons or 7.2 per cent, and miscellaneous, 640,000 tons or 0.5 per cent.

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gross tons valued at $59,615,324. Sources were: Algeria, 446,273 tons; Brazil, 1,037,828; British West Africa, 255,817; Canada, 1,965,114; Chile, 2,768,793; Cuba, 4502; Iran, 1500; Liberia, 110,123; Mexico, 169,563; Spain, 74,306: Spanish Africa, 8750; Sweden, 2,523,543; Tunisia, 134,775; Union of So. Africa, 9450; United Kingdom, 446; Venezuela, 635,416 tons.

Exports from this country in 1951 totaled 4,305,370 gross tons.

Cleveland—The lake ore shipping season is getting under way slowly. Bad ice conditions on the upper lakes will likely prevent heavy movement downward from Lake Superior until well into this month. First American vessels through the Soo locks are expected to be the *Ziesing* and *Kerr* of the Pittsburgh Steamship Co.'s fleet. Iron ore stocks at furnaces and Lake Erie docks on Mar. 1 totaled 27,981,347 gross tons. This compares with 34,446,452 tons on Feb. 1, and with 23,277,903 tons on Mar. 1 last year.

Pig Iron . . .

Pig Iron Prices, Page 206

Cleveland—Threat of a steel strike has not stimulated demand for merchant iron. Ordinarily, in present circumstances, the foundries would be taking in as much tonnage as possible in an effort to beat what appears to be a certain price increase. However, under government inventory control regulations heavy stockpiling is out. For another thing, foundry operations continue to lag so that the urge to cover heavily ahead is lacking. While there is no surplus of iron in this area, merchant sellers are pushing more aggressively for business than has been the case for a long time past. One local blast furnace is down for relining.

New York—While district consumers are exerting no great pressure for iron, the disturbed steel labor outlook is causing some buyers to specify more freely. Some foundries are a little more active. Still another consideration is that cast scrap is not moving so freely for the reason rigid inspections by OPS officials have caused buyers and sellers to move more conservatively.

Boston—Iron shipped from the Mystic furnace in April to complete March orders will be billed at first quarter prices. Second quarter price for No. 2 foundry iron is established at $59.75 per gross ton, furnace, advance of $2.25. Mystic furnace, down for relining, experienced operating difficulties which resulted in delayed scheduling for March. New price is based on December-January average costs. February production was below the 13,000 tons required for average estimates.

Buffalo—District blast furnace operations slipped six points to 94 per cent of capacity as Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp., shut down a furnace for relining. It will be down 45 days. Merchant iron supply remains tight.

Philadelphia—District foundries are in fairly comfortable position on iron supply. Unless there is a prolonged steel strike not much trouble is ex-

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pected. Improvement may come soon at pipe foundries.

Pittsburgh—Demand remains static. Producers look for an upturn in the next 4 to 6 weeks when spring building programs give consumer plumbing and heating castings a shot-in-the-arm.

Chicago—Gray iron jobbing foundries are experiencing better demand for castings and are melting at increasing rate.

Birmingham—Fairfield No. 6 blast furnace of the Tennessee Coal & Iron Division, U. S. Steel Co., was blown out Apr. 1 for relining. The job is expected to require 55 days.

Scrap . . .

Scrap Prices, Page 214

Philadelphia—Mounting threat of a steel strike is causing a freer movement of scrap. Consumers are anxious to take in tonnage and sellers are pressing to get material off their hands. Most mills are maintaining their inventory position, although, in most cases, it is not good. Weakness continues in cupola cast and unstripped motor blocks as has been the case for some weeks past. Cupola cast is quoted on a delivered basis at $48 to $49, and unstripped motor blocks at $40.

Pittsburgh—There is a definite lack of high quality material here. Dealers' collections have fallen off. Scrap campaigns have not been so productive recently. Closer inspection has been, in some measure, responsible for the recent lag in shipments. If the current wage negotiations result in increased steel prices, dealers think their sources of supply will seek higher levels. Whether the OPS would permit increases is problematical. Consumers' stocks range up to three weeks' supply.

Boston—Cast scrap buying is slow and prices are soft on the small volume moved. Prospect of temporary tightening in pig iron supply has failed to stimulate demand. With more steel scrap in sight, consumers are holding for required specifications. District melters have improved inventories.

New York—Weakness continues in cast scrap as reflected in below ceiling prices quoted on various grades. On the basis of f.o.b. New York, cupola cast is quoted $42 to $43 and unstripped motor blocks at $35 where a $4 trucking charge to district foundries is involved.

Buffalo—Material is coming out in greater quantities. Mills' stocks are improved. The cast market is weak with prices ranging to $2 below ceiling.

Cleveland—Steelmakers are taking in all the open-hearth grades of scrap they can get in the face of the threatened strike. Expectations are they will continue to pile tonnage even if they are forced to close their plants. Meanwhile, yard operators are moving tonnage to the mills as rapidly as possible despite the hope in some circles that an increase in scrap prices will be allowed in event steel prices are raised. However, dealers are not banking too heavily on this, being conscious of the fact scrap did not rise with the last increase in steel prices. Reports persist of price shading on the cast grades but it is difficult to run these down. So far as can be learned ceiling prices are being paid on the small tonnages of cast moving.

Detroit—High rate of rejections by mills suggests resistance to present ceiling scrap prices is just around the corner. Cast scrap continues a drug on the market. Some foundries are selling heavy breakable rather than break it themselves. Unclean motor blocks are being bought by brokers for $38, or $5 under ceiling. No. 1 cupola cast commands not more than $47, which is $2 under ceiling. Grades 7 and 11 are being bought for $49 to $50, and heavy breakable is bringing around $42, about $3 under ceiling.

St. Louis—Steel scrap movement is slower with new orders being placed. Mill inventories are comfortable. Caution prevails among buyers and sellers pending strike developments. The cast market is dead. Although no market has been made here in nearly two months, one major consumer estimates all cast grades are obtainable, delivered, at $5 to $6 under ceilings. No. 1 cupola is said to be available at $37 and stove plate at $33. However, no quantity sales of cupola have been made in a long time and the last sizable order of stove plate went at $43 delivered.

Birmingham—Ceiling prices on scrap are of little meaning here. The

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district's largest user has allocations which have not been needed recently. There is virtually no market for cast grades.

San Francisco—Open-hearth grades are flowing freely, but one mill complains quality is poor. Another buyer, however, says the scrap is running pretty much to form. Mills are not getting much No. 1 heavy melting scrap. Most of it is No. 1 and No. 2 bundles. The cast scrap market continues in the doldrums with prices $8 to $10 a ton under ceilings for metropolitan generated material.

Seattle—Heavy melting scrap is arriving in increasing tonnages at tidewater. Supply is sufficient for current consumption but it is impossible as yet to improve inventory position. The largest buyer here has temporarily ceased purchasing bundles. The same interest is also out of the cast iron market. Ceiling prices prevail for heavy melting. Bethlehem is breaking up the 13,788 gross ton steamer *Wharton* at a local plant. Cast iron scrap is reported quoted at $28 per ton in the Pacific Northwest.

Warehouse . . .

Warehouse Prices, Page 213

Pittsburgh — No appreciable increase in inquiry is felt due to the threatened steel strike. Stocks are unbalanced. Generally, hot and cold-rolled sheets are in good supply with galvanized tight. Standard pipe, nails and small cold-finished bars are coming into much easier supply. Reports are heard of price cutting to the tune of $2 to $4 per ton on small cold-finished bars.

Philadelphia — Warehouse activity is off a bit. Should a steel strike develop it appears warehouse sales may be restricted to preference ratings under government control.

Boston — Slackening demand for steel warehouse products is evenly distributed among carbon stocks. Inventories are unbalanced in heavier items, plates shapes and bars. Tonnage from mills is heavier, mostly in flat-rolled. Merchant wire products and pipe, notably buttweld, are in better balance.

Cleveland—Expectations are warehouse stocks of steel will be frozen by the government in event of a steel strike, movement of tonnage being limited to strictly essential consumption. Meanwhile, demand on the warehouses has improved slightly in recent weeks, reflecting seasonal influences. Mill receipts of tonnage are up, though some distributors noted a slackening in mill shipments the latter part of March.

Seattle—Warehouse volume is increasing with opening of the Alaska season, resumption of logging and expanded outdoor construction. There is no improvement in supply of scarce items, consequently inventories are not rising.

STRUCTURAL SHAPES . . .

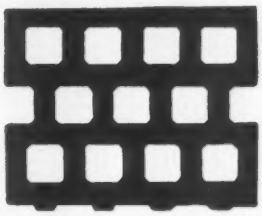
STRUCTURAL STEEL PLACED

12,650 tons, miscellaneous bridge work, state turnpike, West Virginia, to Bethlehem Steel Co., Bethlehem, Pa.

12,270 tons, miscellaneous bridge work, state turnpike, West Virginia, to American Bridge Co., Pittsburgh.

5680 tons, Vernon Avenue bridge, Department

Perforated metal screens *for any requirement*



WITH facilities for producing any shape and size of perforations in any commercially rolled metal, of whatever gauge desired, Hendrick can furnish the most suitable form for a specific screening application.

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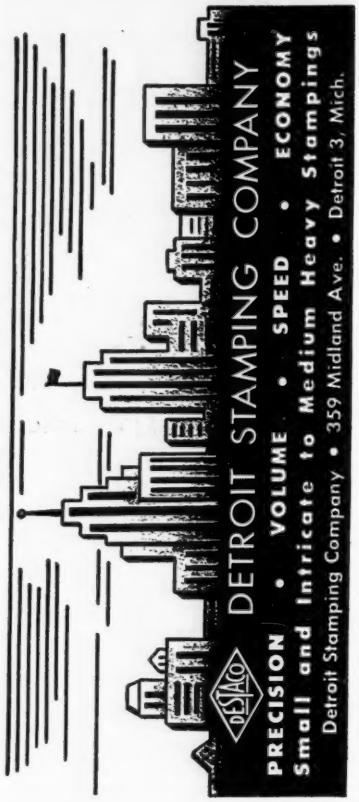
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of Public Works, Brooklyn, N. Y., through Horn Construction Co., to Bethlehem Steel Co., Bethlehem, Pa.

2220 tons, state bridge, Lancaster county, Pennsylvania, through C. W. Good Inc., general contractor, to Lehigh Structural Steel Co., Allentown, Pa.

1200 tons, warehouses, advance naval base, Davisville, R. I., to Bethlehem Steel Co., Bethlehem, Pa.; Perini Construction Co., Framingham, Mass., general contractor.

860 tons, warehouse, Army Transportation Depot, Marietta, Pa., through H. B. Alexander & Son, Harrisburg, Pa., general contractors, to Anthracite Bridge Co., Scranton, Pa.

815 tons, infirmary, State hospital, Central Islip, L. I., through Lasker-Goldman Co., New York city, general contractor, to Grand Iron Works, that city.

605 tons, state bridge, Bergen county, New Jersey, through Sperin, Preston & Burrows, to Schacht Steel Construction Inc., New York city.

570 tons, 60-ft. interlocking sheet piling, U. S. naval construction battalion center, Port Hueneme, Calif., to Columbia-Geneva Steel Div., U. S. Steel Co., Los Angeles.

475 tons, shop building, naval air station, Quonset Point, R. I., to Haarman Structural Steel Co., Holyoke, Mass.; W. J. Halloran Co., Providence, R. I., general contractor.

425 tons, factory, Chicago Pneumatic Tool Co., Fort Worth, Tex., to Mosher Steel Co., Houston, Tex.

385 tons, traffic interchange bridges, Cranston-Warwick, R. I., to Bethlehem Steel Co., Bethlehem, Pa.; M. A. Gammino Construction Co., Providence, R. I., general contractor.

350 tons, warehouse, Star Machinery Co., Seattle, to Pacific Car & Foundry Co., Seattle; Cawdrey & Vemo, Seattle, general contractors.

265 tons, tees and small shapes, Navy purchasing office, Washington, to Jones & Laughlin Steel Corp., Pittsburgh.

200 tons, motor vehicle pool building, Ft. Lewis, Wash., to Isaacson Iron Works, Seattle.

STRUCTURAL STEEL PENDING

7200 tons, superstructure, contract H-2, Fitzgerald expressway, North to Oliver streets, Boston; bids Apr. 22, state department of public works.

4200 tons, superstructure, part 1, contract C-2b, Fitzgerald expressway, Boston, Bethlehem Steel Co., Bethlehem, Pa., low, $2,408,-149.33; American Bridge Div., U. S. Steel Co., Pittsburgh, $2,489,214.20.

3950 tons, superstructure, contract H-2b, Fitzgerald expressway, Commerce to Oliver street, Boston; bids Apr. 22, state department of public works.

3600 tons, superstructure, contract H-2a, Fitzgerald expressway, North to Commerce street, Boston; bids Apr. 22, state department of public works.

900 tons, naval ammunition depot, Nebraska.

600 tons, six Army shop buildings, Aberdeen, Md., bids Apr. 18.

500 tons, Albeni Falls dam project, Idaho; general contract awarded Donovan-Foley-Winston-Lytle-James, joint low, $8,607,246.

REINFORCING BARS . . .

REINFORCING BARS PLACED

375 tons, nursing school, Confederate Memorial Center, Shreveport, La., to Connors Steel Co., Birmingham; Southern Builders, Shreveport, La., general contractor.

220 tons, elementary school addition, Lynn, Mass., to United States Steel Supply Div., U. S. Steel Co., Boston; Concrete Construction Co., Chelsea, Mass., general contractor; fabricated structural steel to Mystic Steel Co.

200 tons, naval base project, Kodiak, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Drake-Puget Sound, Seattle, general contractor.

107 tons, warehouse, Star Machinery Co., Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

18,500 tons, Chief Joseph dam and powerhouse; Columbia River Contractors low.

4000 tons, Albeni Falls dam project; general contract awarded by U. S. Engineer, Seattle.

2065 tons, deck, elevated highway section, contracts C-3, D-3 and H-3, Fitzgerald expressway, Charles river bridge to Oliver street, Boston; bids Apr. 22, state department of public works, Boston.

575 tons, reinforced concrete culverts, Middletown expressway, Middletown, Conn.; bids Apr. 15, Hartford, Conn.

150 tons, 19.9 mile canal, Columbia Basin project; bids to Ephrata, Wash., Mar. 31.

120 tons, reinforced concrete culverts, Fenton river, Mansfield, Conn.; bids Apr. 14, Hartford, Conn.

110 tons, Washington state Spokane river bridge; bids to Olympia, Apr. 15.

PLATES . . .

PLATES PLACED

16,500 tons, to Beall Pipe & Tank Co., Portland, Oreg., 25.5-mile Portland Bull Run water conduit; general contract to Kuckenberg Construction Co., Portland, low $4,974,-675.

2235 tons, hull plates, Navy purchasing office, Washington, to United States Steel Co., Pittsburgh.

200 tons, two bulk oil barges for Alaska railroad, to Albina Engine & Machine Works, Portland, Oreg., low $184,752.

100 tons or more, elevated steel water tanks, Depot of Supplies, Marine Corps, Albany, Ga., to R. D. Cole Mfg. Co., Newman, Ga., $208,925.

100 tons, water storage tank, Larsen airfield, Spokane, Wash., to Chicago Bridge & Iron Co., Seattle.

PLATES PENDING

200 tons, including shapes, two 120-ft. river tugs for Alaska railroad; rebids to Seattle, Apr. 3.

PIPE . . .

CAST IRON PIPE PENDING

2000 tons, 14,000-ft. 20-in. and 954-ft 16-in., class 250, for system expansions; bids to Seattle Apr. 8.

Unstated, 10,000-ft 6-in. and smaller; bids to Marjorie Dudley, clerk, Moses Lake, Wash., Apr. 4.

Unstated, 5.5-mi. 6 to 12-in.; bids to King County District No. 42.

STEEL PIPE PENDING

Unstated, 24-in. water mains replacing 20-in. wood pipe; bids to Port Townsend, Wash., about May 6.

RAILS. CARS . . .

LOCOMOTIVES PLACED

Bangor & Aroostook, four 1500-horsepower diesel-electric general purpose units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Central of Georgia, six 1200-horsepower, diesel-electric locomotive switching units to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Chesapeake & Ohio, seventeen 1500-horsepower diesel-electric road-switching units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Lehigh Valley, three 800-horsepower diesel-electric locomotive units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Reserve Mining Co., two 800-horsepower diesel-electric switching locomotive units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Southern Pacific, 188 diesel units, to the Electro-Motive Division, General Motors Corp., La Grange, Ill.; the Baldwin-Lima-Hamilton Corp., Eddystone, Pa.; the American Locomotive-General Electric Companies, Schenectady, N. Y.; and Fairbanks-Morse & Co., Chicago.

Wabash, five 1500-horsepower general purpose diesel units, and four 3000-horsepower, two-unit diesel-electric locomotives, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

RAILROAD CARS PLACED

Gulf, Mobile & Ohio, 200 pulp wood cars, to its Bloomington, Ill., shop.

RAILS PLACED

Lehigh & New England, 415 tons, to Bethlehem Steel Co., Bethlehem, Pa.

THUMB NAIL DATA ON ANOTHER WESCHE SPECIAL MOTOR SUCCESS STORY

Customer: HYDROPRESS, Inc., N. Y.

Problem: Motors in 8 different sizes to power every kind of steel mill roller table for individual direct drive of the rollers.

Solution: As illustrated totally enclosed, fin cooled, A.C. three phase, 50 cycle motors, in this case 150 R.P.M.

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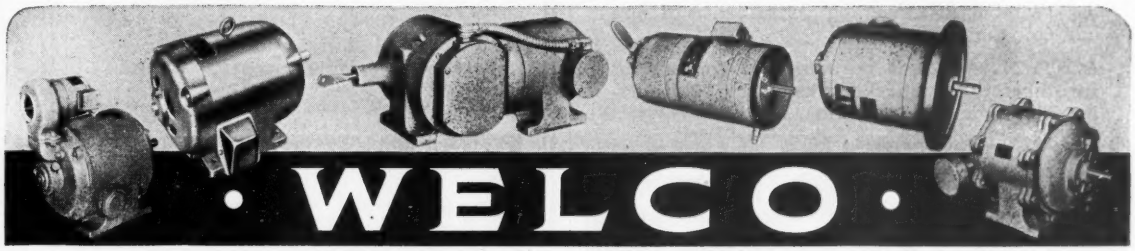

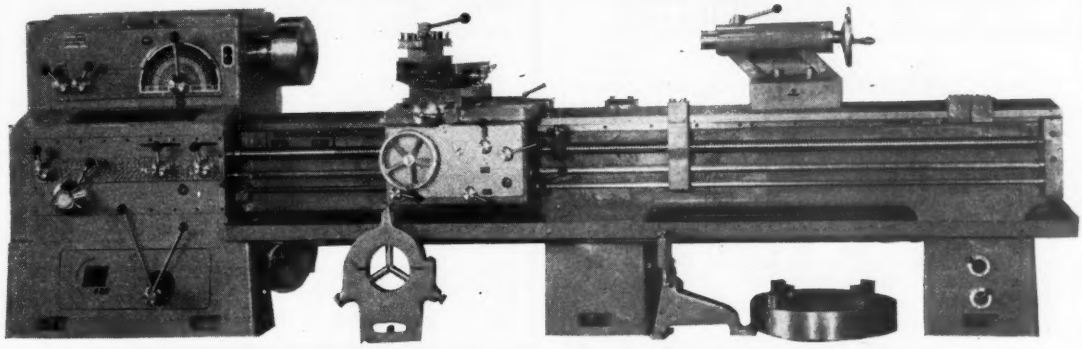

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24", 28" and 32" SWING, ALL GAP BED TYPE, UP TO 240" CENTERS
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Illustrated above: 24" x 100" Centers New Meuser Lathe, Gap Bed Type, 34" Swing in Gap, 27 Spindle Speeds, (7.8—900 RPM). Complete with the following equipment: Three and Four Jaw Chucks, Follow Rest, Steady Rest, Four way Tool Post, Centers, Standard Tool Post, Threading Dial. Carriage Stops, Taper Attachment.

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The addition of a small amount of ACTIVOL #1321 to the acid bath assures quick and maximum drain-back of acid from pickled parts into the bath reducing carryover acid loss as high as 40% in many cases. ACTIVOL #1321 is effective with all acids, mineral and organic, in baths up to 40% concentration by weight of acid. (For higher concentrations of acid, use ACTIVOL #1357). Subsequent rinsing is materially improved by having less acid actually carried into the rinse than previously. In addition ACTIVOL accelerates the action of the acid in the pickle bath without affecting the performance of any inhibitor that is used.

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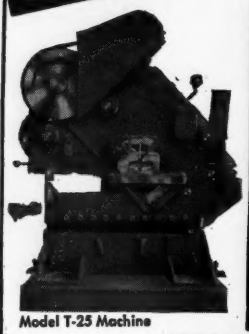

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	Model T-15	Model T-25
to Punch	7/8" x 7/16"	1" x 9/16"
to Shear		
Plates	7/16"	1/2"
Flat Bars	3" x 9/16"	3-3/16" x 5/8"
Tees	3-1/8" x 5/16"	4" x 3/8"
Angles	3-1/8" x 5/16"	4" x 3/8"
Round Bars	1-3/16"	1-3/8"
Square Bars	1"	1-1/4"

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Yoder Opens New York Office

Yoder Co., Cleveland, maker of electric-weld tube mills and cold roll-forming and slitting machinery, opened an office at 11 W. 42nd St., New York, to handle sales in New England, New York and the Atlantic Coast territory.

Bethlehem Expands Ore Dock

Bethlehem Steel Co. will increase the unloading capacity of its iron ore pier at Sparrows Point, Md., by 6600 tons an hour through lengthening and installation of equipment to handle three ore carriers at a time.

Niagara Opens Sales Branch

Niagara Machine and Tool Works, Buffalo, manufacturer of sheet metal working machines and tools, is opening a Philadelphia sales office at 50 E. Wynnewood Rd., Wynnewood, Pa.

Gaillard Seminar Planned

Next Gaillard Seminar in industrial standardization will be held June 23 through 27 in New York. For details write Dr. John Gaillard, 400 W. 118th St., New York 27.

Harbison-Walker Expands

Harbison-Walker Refractories Co. expects facilities nearing completion at its Fairfield, Ala., plant to increase production 50 per cent.

Malayan Tin Bureau Set Up

New Malayan Tin Bureau at 1028 Connecticut Ave., Washington 6, will provide information about Malayan tin production and marketing developments.

G. M. Canada Truck Plant

General Motors of Canada Ltd. will erect a $10 million plant at Oshawa, Ont., for the assembly of trucks, says William A. Wecker, president.

Malone Metal Powders Starts

Malone Metal Powders Inc., Malone, N. Y., is being formed to make special metal powders used in defense work.

New Manganese Plant

Westmoreland Manganese Corp. plans a $4.5 million manganese ore beneficiating plant at Batesville, Ark.

New John Hewson Office

John Hewson Co., New York, opened its Philadelphia offices in the National Bank Bldg., Ambler, Pa., Box 163, for distribution of high voltage electrical instruments in eastern Pennsylvania, Delaware and southern New Jersey.

Perfect Circle Buys Company

Perfect Circle Corp., Hagerstown, Ind., bought Centrifugal Foundry Co., Muskegon, Mich., maker of cylinder sleeve castings by centrifugal casting.

Aviation-Industrial Agent

Aviation-Industrial Division of Fine Organics Inc., New York, appointed Canadian Hanson & Van Winkle Co. Ltd. sales representatives and stock distributors of its cleaners and solvents in Canada.

U. S. Rubber Latex Plant

Nagatuck Chemical Division of U. S. Rubber Co. has completed a new plant in Los Angeles for manufacture of rubber latex and plastic materials.

New American Chain Division

ACCO Casting Division, American Chain & Cable Co. Inc., Bridgeport, Conn., will assume responsibility for the firm's sale of steel, gray iron and malleable castings.

Raybestos Installs Grinder

Raybestos-Manhattan Inc., Manhattan Rubber Division, Passaic, N. J., installed the largest precision roll grinding machine in the rubber industry at its roll covering plant in North Charleston, S. C.

Basic Buys Sierra Magnesite

Basic Refractories Inc., Maple Grove, O., acquired the physical assets of Sierra Magnesite Co. of Nevada, says H. P. Eells Jr., president.

$2 Million Plant for Canada

Canada Iron Foundries, Hamilton, Ont., is erecting a $2 million plant to produce an estimated 400 tons of ingot molds daily.

Northern Electric Expands

Northern Electric Co., Lachine, Que., manufacturer of wire and cable, started a 280,000 square foot expansion.

Cleco Names Bristol

Cleco Division of Reed Roller Bit Co., Houston, appointed Bristol Metal Working Equipment Co., Hartford, Conn.; S & M Supply Co., Grand Junction, Colo.; and Quinn Welding Supply

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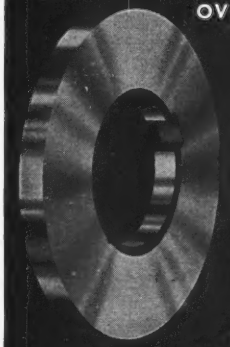

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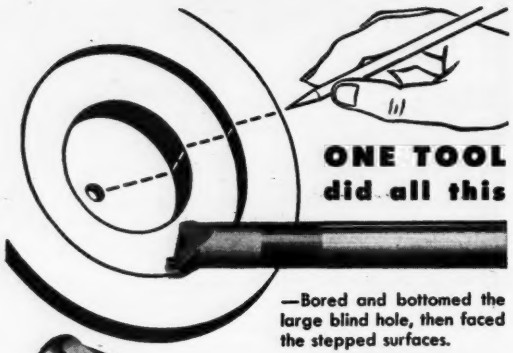

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for general boring

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for bottoming and facing

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for threading

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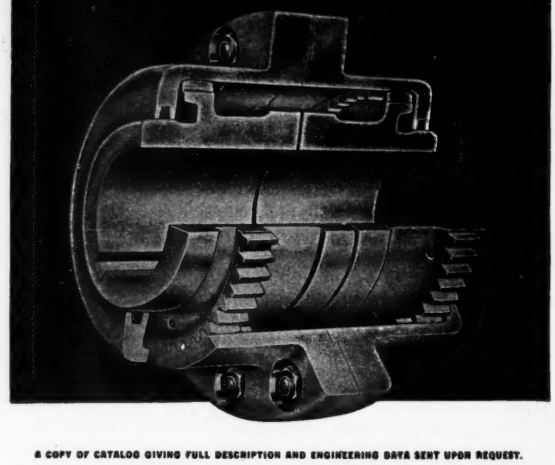

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POOLE FOUNDRY & MACHINE COMPANY — WOODBERRY, BALTIMORE, MD.

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For Concrete Reinforcing Bars

Model D-2

The Model D-2 Kardong Bender is a Four Direction Horizontal Bender. With this bender it is not necessary to turn bars over to make reverse or second bends on beam bars. The Model D-2 is made in two sizes, Model D-2 Standard 6-inch, which will bend bars around collars 2-inch to 6-inch, and Model D-2 Special 8-inch, which will bend bars around collars 2-inch to 8-inch. Capacity of both models, 1¼-inch Square Bars. The Model D-2 is a production bender for reinforcing steel fabricating shop. Ask for catalog of our complete line of reinforcing bar benders.

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DRILLING
BORING
HONING
TAPPING and
Special Machines

Center, Chicago Heights, Ill., distributors for Cleco air tools and accessories in their areas.

American Machine Buys Firm

American Machine & Foundry Co., New York, purchased control of Thompson-Bremmer Co., Chicago, maker of industrial fasteners and electric terminals.

G. E. Expands Grants

General Electric Co., Schenectady, N. Y., is expanding its educational grants to $370,000 to help alleviate the engineer shortage.

McLouth Steel Opens Office

McLouth Steel Corp., Detroit, opened a Chicago sales office at 310 S. Michigan Blvd.

Rittling Remodels Station

Rittling Corp., Hamburg, N. Y., manufacturer of heat-transfer products, acquired the Erie Railroad passenger station near its plant property. The building will be remodeled and used as a warehouse and shipping point, says Charles P. Rittling, president.

Sylvania Opens New Plants

Sylvania Electric Products Inc., Boston, will open a new electronics manufacturing and research division at Woburn, Mass., and a magnetron and klystron production plant in Newton, Mass.

Millionth Jeep for Willys

Willys-Overland Motors Inc., Toledo, O., completed its millionth jeep. The first military jeep rolled off the lines in November, 1941.

Claymont To Expand

Claymont Steel Corp., Claymont, Del., plans a $121,545 expansion to produce steel plate for the Navy.

Hewitt-Robins Buys Firm

Hewitt-Robbins Inc. has bought the outstanding stock of Korb-Pettit Wire Fabrics & Iron Works Inc., Philadelphia, producer of woven wire fabric screen cloth used in Hewitt-Robins vibrating screening machinery.

American Can Shuts Plant

American Can Co. permanently closed its factory at 2401 Venable St., Richmond, Va.

Roots-Connersville Absorbed

Roots-Connersville Blower Corp., Connersville, Ind., will be absorbed into the corporate structure of its parent organization becoming Roots-Connersville Blower, a division of Dresser Industries Inc., Dallas.

Another Problem Solved

The problem of super-hot exhaust gases from jets has been solved at the National Advisory Committee for Aeronautics' Cleveland laboratory. This giant cooler, made by Biggs Boiler Works Co., Akron, reduces the temperature of the gas by spraying it with water as it passes through a series of wrought iron perforated pipes

Buffalo Forge To Build

Buffalo Forge Co., Buffalo, will build a $100,000 receiving and storage building.

Arcola Moves to Salem

Arcola Foundry & Mfg. Co. is moving its entire operation to Salem, Ill., with facilities to produce 35 tons of gray iron castings per day.

Roebling's Moves Office

John A. Roebling's Sons Co., Trenton, N. J., moved its Los Angeles district office to 5340 E. Harbor St., that city.

Edison Starts New Lab

Thomas A. Edison Inc., West Orange, N. J., broke ground for a new research laboratory to support operations of the firm's seven manufacturing divisions.

Allis-Chalmers Names Agent

Empire State Equipment Co., 36-38 Randall St., Providence, R. I., will handle Texrope drive equipment for Allis-Chalmers Mfg. Co. in Rhode Island.

Fitzpatrick Is Colton Agent

Newly formed Fitzpatrick Engineering Co. Inc., Chicago, will supply Arthur Colton Co., Detroit, filling, closing, packaging and tableting machines and heavy duty presses to the plastic,

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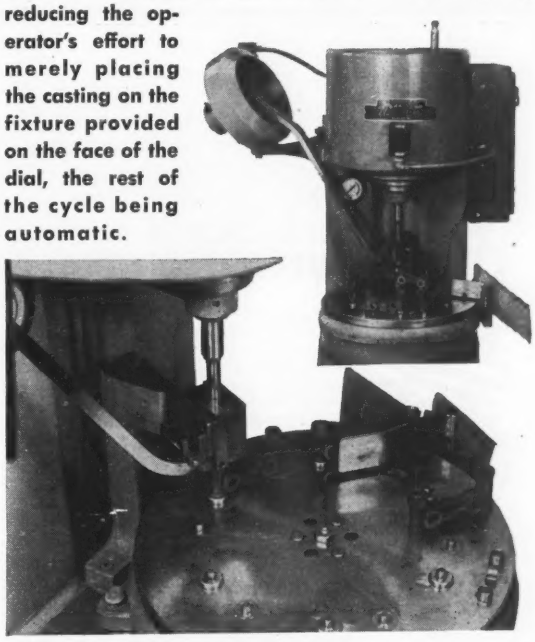

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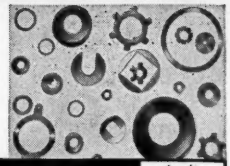

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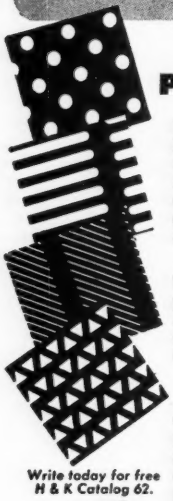

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metal powder and other industries in seven midwestern states.

Worthington Pump Renamed

Worthington Pump & Machinery Corporation, Wilmington, Del., will become Worthington Corp. in view of diversification of its manufactured products.

Al-Fin Process Licensed

Aluminum Co. of America and Bohn Aluminum & Brass Corp. are licensed to use the patented Al-Fin process for the molecular bonding of aluminum to iron or steel by Al-Fin Division of Fairchild Engine & Airplane Corp., N. Y.

Enterprise To Build

Enterprise Aluminum Co. will erect a new aluminum cookware factory at Oneonta, N. Y.

Seattle Chain Renamed

Seattle Chain & Mfg. Co. will assume the name Round Seattle Chain Corp. to identify it more closely with the nationwide Round organization.

Republic Aids Teachers

Republic Steel Corp., Cleveland, is providing funds to take 50 professors of economics and social science behind the scenes in business and industry this summer. The grants are being administered through Case Institute of Technology.

New Rust-Oleum Agents

Buhl Sons, Detroit, and Republic Supply Co., Los Angeles, are new Rust-Oleum distributors of rust prevention products.

Bjorksten Opens New Lab

Bjorksten Research Laboratories completed a new building at Madison, Wis. Work at the new building will supplement research carried out at the laboratories' Chicago headquarters in mining and metallurgy.

American Forge Goes West

American Forge Division of American Brake Shoe Co., New York, plans West Coast steel forging operations by mid-year in the former Jumbo Steel Co. buildings at Azusa, Calif.

IT&T Buys Kellogg

International Telephone & Telegraph Corp. acquired Kellogg Switchboard & Supply Co., Chicago, through an exchange of stock.

Reynolds Metals To Build

Reynolds Metals Co. plans a $30 million aluminum reduction plant at Gum Springs, Ark.

Vacuum Metals Formed

National Research Corp., Cambridge, Mass., formed a subsidiary, Vacuum Metals Corp., also of Cambridge, to utilize its processes in vacuum cast gas free metals and alloys.

Westinghouse Awards

Westinghouse Electric Corp., Pittsburgh, presented $5000 awards to Dr. Winthrop M. Leeds and Benjamin P. Baker for an outstanding circuit breaker invention under the company's special awards program.

Boeing Computer Expansion

Boeing Airplane Co., Seattle, is planning expansion of its commercial computer and associated components output.

Home Air Group Formed

Manufacturers report progress in forming a trade association known as the Residential Air Conditioning Section of the Air Conditioning and Refrigerating Machinery Association. New group is headed by J. A. Gilbreath of Servel Inc., Evansville, Ind.

Orinoco Mining Buys Cars

Orinoco Mining Co. placed orders for 560 gondola-type, 100-ton ore cars and nine 1600 hp diesel electric locomotives to haul iron ore in Venezuela.

New U. S. Air Export Office

United States Air Conditioning Corp., Minneapolis, announces a new export department at 13 E. 40th St., New York.

Anaconda Plant Started

Anaconda Copper Mining Co. started construction of a $40 million ore concentration plant at Yerington, Nev. The new plant is expected to handle 11,000 tons of copper ore daily, yielding 35,000 tons of copper annually.

Drake Steel To Build

Drake Steel Supply Co., Los Angeles, has started construction of a new office and warehouse building in San Diego, Calif.

Barber-Colman Buys Wheelco

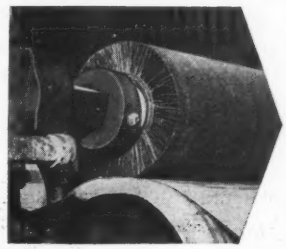
Barber Colman Co., Rockford, Ill., is purchasing principal assets of Wheelco Instruments Co., Chicago, and will gradually transfer operations of Wheelco to Rockford.

BMC Mfg. To Expand

BMC Mfg. Corp. started construction of a $500,000 addition to its metal products plant in Binghamton, N. Y.

How Pittsburgh Brushes SPEED PRODUCTION

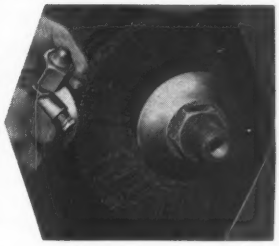
1. Removing oil film from steel!



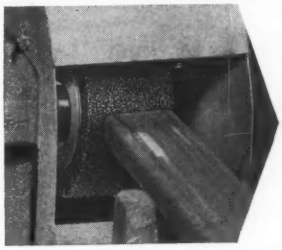
Crown Cork & Seal Co., Inc., asked Pittsburgh engineers to recommend a brush suitable for washing oil film from steel before annealing. A "built-up" brush made of Tampico sections was installed. Oil and foreign matter were completely removed without harming the surface of the steel. Production showed an immediate increase, and time saved due to fewer brush replacements added to the overall savings.

2. Satin-finishing brass fixtures!

Frequent breakdowns and brush changes hampered Bastian-Blessing Company's production of satin-finish parts for its products. Pittsburgh engineers recommended a crimped steel, standard 10" brush. Reports after three years' use show Pittsburgh Brushes have increased production, improved quality and saved materials . . . while lasting *three times longer* than previous brushes!



3. Removing burrs from steel!



Problem: The National Electric Company needed a brush to eliminate burrs and scale, yet the brush had to combine cleaning ability with long life. Solution: Pittsburgh designed a brush to specifications—a brush that was stiff and tough enough to penetrate, clean, and remove burrs and scale, and rugged enough to stand up. Result: An increase in efficiency; a jump in production!

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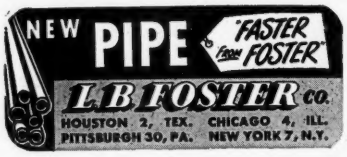

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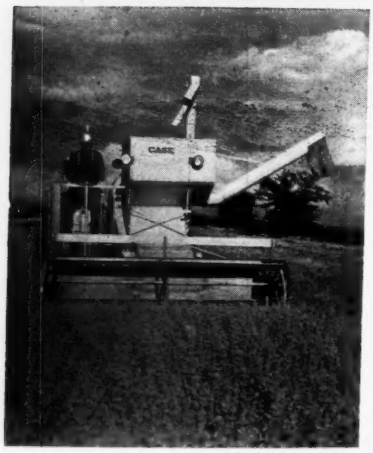

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